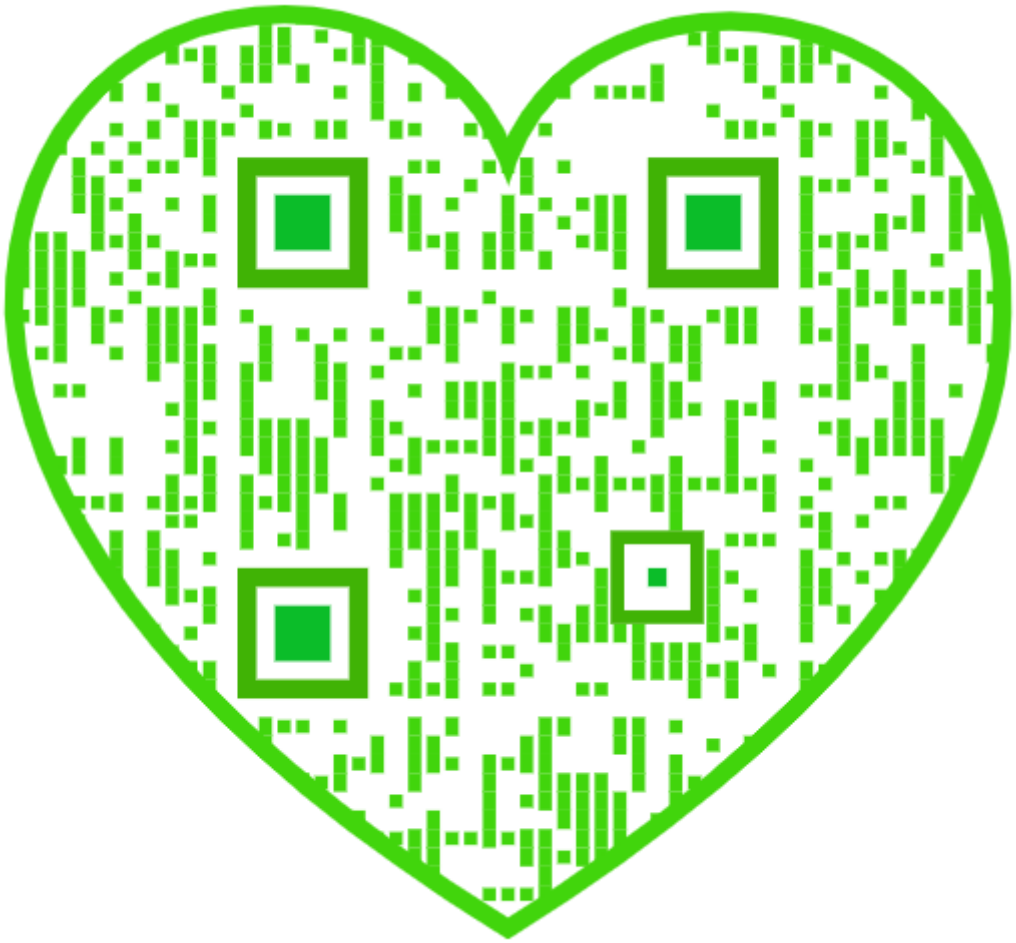
THE FARMER'S PRACTICAL VETERINARY GUIDE



Class SF751
Book .S9
Copyright No.

COPYRIGHT DEPOSIT.

THE FARMER'S
Practical Veterinary Guide

The result of years of practical experience in the production of live stock and the application of the principles of modern veterinary training

BY
Earl T. Steele B. S. A.

Copyright 1921
By
Earl T. Steele B. S. A.
All rights reserved

SF751
.59

Printed by
Hatcher Printing Company
Chillicothe, Missouri

AUG 19 1921

©Cl. A622467

PREFACE

So far as the author has been able to determine there is no book that the farmer can buy at the present time that has been written with the idea of giving the farmer a general idea of the modern scientific treatment of the diseases of live stock.

Modern veterinary books are not written in terms that the live stock producers can understand.

The result has been that the farmer has often adopted questionable methods from such sources as are available in the treatment of live stock diseases.

Scientific research has contributed as much to veterinary medicine in the last thirty years as any other branch of agriculture.

The value of a knowledge of veterinary medicine to the farmer cannot be appreciated by any one more fully than by the author since he has experienced farming with and without such knowledge.

The author has been continually approached by farmers seeking knowledge such as is offered in this book of modern veterinary methods. Such methods have not only been appreciated by farmers but in many cases they have been permanently adopted with success in their farm operations.

Many farmers may still be skeptical about the value of the information given out by scientific institutions but such men can not get away from good farming practice as advocated by men who have had a life time experience devoted to live stock farming.

While the especially trained man is essential in many cases in dealing with the diseases of live stock, yet it is neither necessary or practical to call such assistance for every case. In some states where statistics are available the losses of smaller animals such as sheep, pigs and

poultry is amazingly large. Such losses can be greatly reduced by the farmer having a knowledge of veterinary medicine. The losses from contagious diseases such as hog cholrea, bovine tuberculosis and other diseases can be greatly reduced by proper herd management. A knowledge of such diseases not only results in financial benefit to the farmer but is of equal benefit to the people of the state and nation.

In addition to the contents of this book being composed of the knowledge which I have gained from prcatical experience and veterinary training. I am indebted to the results of modern research investigation as conducted by experiment stations and the U. S. Department of Agriculture for public benefit.

I am especially indebted to the United States Department of Agriculture for duplicate electrotypes used to make many of the cuts.

THE AUTHOR

BACTERIOLOGY

Bacteria are single celled vegetable organisms, round, cork screw or oblong in shape. Bacteria have power of movement but are classed as plants by most biologists because they multiply by division of the cell into two parts each of which makes separate bacteria capable of reproduction.

No bacteria are visible except by the aid of a microscope capable of magnifying their size many hundred times.

Varo, who lived about the time of Christ, conceived of the idea that possibly some diseases were caused by invisible organisms but no particular attention was given the subject till about the beginning of the seventeenth century when some one perfected a lens that would magnify one hundred and fifty times and living organisms were discovered in what was considered pure water.

However these organisms which they saw were not bacteria, but led up to the perfection of a good microscope which enabled Pasteur, Koch, Kohn and others about 1865 to 1870 to establish firmly the fact that bacteria or their products are the cause of many diseases. Their findings have cleared away many of the mysteries that once made veterinary medicine a dark field.

The germs causing hog cholrea are not present in glanders of horses neither are the germs causing distemper of horses to be found in hogs that die with pneumonia. That is to say the fact is well established that for specific diseases certain bacteria or groups of bacteria are always present.

The presence of these bacteria is not supposed to cause the sickness, but the waste products which bacteria throw off from their bodies cause

the sickness. Bacteria give off waste products much the same as animals do, these waste products may become so rancid to the bacteria that it is the cause of their death and hence the disease ends. In cream lactic acid bacteria live till the cream sours and then they die and then the puterifying bacteria find suitable food and they thrive a few days and the food becomes so poisonous that they too die.

The poisonous products which bacteria give off are called toxins and in every bacterial disease the effected animal throws off an anti-toxin or medicine to counteract or neutralize the effect of the toxins of the bacteria. That is the sick animal's body manufactures the anti-toins. In every disease the anti-toxin is of different composition. That is the anti-toxin of hog cholrea or anti-hog cholrea serum has no effect on pneumonia bacteria but if properly made and administered it prevents hog cholera. That is hog cholrea germs can not develop in its presence. A hog may be able to manufacture sufficent anti-toxin to recover from hog cholrea (in rare cases) if they don't recover it is generally supposed that the bacteria develop poisons faster than the hog can develop anti-toxin to neutralize the effect of the poison of the bacteria.

Man has not been able to develop elements of a composition that will kill the bacteria of many diseases without killing the patient, however man can develop through animals bacterial products that protect healthy animals.

In the vaccination of calves to prevent black-leg and anywhere a vaccine is used we inject into the animal's body weakened germs of the disease. These germs are usually weakened by heating to a definite temperature. As soon as these germs are placed beneath the skin they begin to multiply but not so rapidly as healthy germs, hence the animal has sufficient time to manufacture enough anti-toxin to neutralize their poisons, or kill the germs. This causes the calf to fill his blood with the anti-toxin and the animal is able to resist black-leg.

There are bacterins injected for the prevention or cure of many diseases. Bacterins are made for poll-evil, fistula etc. and are called polavalent bacterins. The pus is taken from a fistula and grown in an especially prepared beef broth for a number of hours, while in the beef broth the bacteria throw off their poisonous products after which they are killed. Then a small amount of the broth is injected under the skin of the horse and as soon as this happens the horse is supposed to go to work to manufacturing an anti-toxin to counteract the poison even though no bacteria are injected. By the horse making sufficient anti-

toxin in the blood the horse is supposed to kill the germs of the fistula. In some cases it seems to be of benefit as a curative agent. These bacterins which are injected under the skin are offered for sale by laboratories for hemorrhagic, septicemia, white scours, influenza, contagious abortion, and joint ill.

The chief use of such becterins are to be found in using them to prevent a portion of the herd from developing an infectious disease.

GENERAL PRINCIPLES OF VETERINARY MEDICINE

All the treatments that the veterinarians of the land can devise would not be of as much benefit to the farmer as the prevention of disease by the farmer himself. More credit should be given the farmer who can keep his herd healthy by having a knowledge of the causes of diseases, and thereby preventing them than to the farmer that is able to cure all. By a knowledge of the causes and how diseases travel any farmer can prevent many cases of diseases among his live stock without the use of drugs, bacterins or other products. Such diseases as colic, lock-jaw, navel ill, barb wire cuts, fistula, contagious abortion, forage poisoning, white scours in calves, hog cholrea, worms and scab of sheep, white diarrhoea and roup of chickens as well as a multitude of others can be prevented in most cases if the farmer has a thorough knowledge of the causes of diseases as given under various headings.

However it is impossible to prevent all diseases and as long as the live stock industry exists we'll have sick stock from various reasons other than carelessness.

When an animal gets sick the success of treatment will be in proportion to the good common sense used in treating the disease. First try to locate the effected organ. That is try to determine whether the disease is one of the intestines, kidneys, nerves, blood, muscles or skin. This can be done in most cases by a study of the symptoms. However colic is often mistaken for kidney disorder and intestinal disorders are mistaken for brain disorder. Brain troubles of stock are usually due to forage poisons in the intestines. Horses poisoned in stalk fields go in circles, etc. Cattle eating moldy corn fodder or moldy silage go in circles, turn only one way, lose control of their muscles etc.

Then the next point to a successful recovery is to aid in the removal of the trouble. The less of treatments we use that have no basis the

better will be our success. In case of bowel disorder or where the system is filled with poison a physic is usually given first.

In cases of intense pain medicines are given to relieve the spasm of the effected organ. In cases of gas formation drugs are given to open up the bowels and absorb the gas.

In cases of blood disorders we give medicines to purify the blood and as most blood diseases are contagious, bacterins, vaccines, or antitoxins are injected under the skin of the healthy animals to prevent them from developing the disease.

In cases of sprains, bruises etc. we try to reduce the swelling by causing increased circulation of the blood to the effected part. One of the duties of the blood is to equalize body temperature therefore if any part of the body is abnormal in temperature the blood rushes to that part and the excess of blood carries away the poisons associated with the disease. This is done in the case of swellings, bruises etc. by the alternate application of hot and cold clothes, lineaments, blistering and bandaging. Ordinary cotton batting tied on a swelling holds the flow of blood to the part to equalize the body temperature, and the excess blood brings many white blood corpuscles which are the scavangers of the animal's body that kill bacteria.

If the cause of the disease can be located it must be removed. If the cause is in the food change the diet. If the cause is due to work put the animal on a rest. If the fever is high furnish abundance of water at frequent intervals. These matters of care as feed and water are important to success and no one will furnish the care as efficient as the owner himself. Some medicines lose their strength when they become old, some evaporate when exposed to the air. One can not expect good results with deterioated or diluted drugs. Some drugs and formulas are sold under patent names for exorbinate prices, frequently they give good results for the disease for which they were formulated.

HORSES

DISEASES OF THE DIGESTIVE TRACT

COLIC

There are three kinds of colic more frequently met with in horses and they have been given at least nine different names. Below I place their simplest names and enclose in brackets other names frequently applied to them.

I

Compaction Colic, [Engorgement Colic], otherwise known as [Obstruction Colic] and sometimes improperly called [Indigestion].

II

Wind Colic or Bloat otherwise known as [Flatulent Colic] and [Gastro Tymphany].

III

Cramp Colic [Spasmodic Colic].

GENERAL CAUSES OF COLIC

Colic is usually caused by a horse receiving too much of a feed that their digestive tract is not in the habit of digesting. It often happens when a horse is changed from old corn or oats to new corn or oats. This is especially true if the animal is lightly worked. Watering only after feeding has a tendency to colic. Old dead grass mixed with short new grass often causes colic. Too much dry feed such as dry grass, corn stalks or wheat straw may cause colic. This is especially true if the weather is cold and the horse fails to drink sufficient water for digestive purposes.

Some times the teeth cause horses to eat ravenous and they fail to chew the food sufficient for digestive purposes.

COMPACTION COLIC

I Compaction Colic, [Obstruction Colic], [Engorgement Colic] and often improperly called [Indigestion] [Constipation].

Compaction colic is probably the most dangerous form of colic. While the disease itself is probably no more dangerous than other forms of colic, often times we are prone to console ourselves by thinking the horse is not very sick because he does not exibit all the symptoms of intense pain.

However if the owner waits a few hours in a case of compaction colic for the horse to develop symptoms of intense pain the chances for recovery are greatly reduced. But on the other hand if he begins treatment as soon as the first symptoms develop, giving himself ample time to get the horses bowels to move, the results will be highly satisfactory in a very high per cent of the cases.

CAUSES

Any food taken into the horse's intestional canal in an improper shape for digestion may cause this form of colic. Among the more specific causes are change from grass in the fall to dry stalks or other dry feeds with a constipating effect. Horses that have been accustomed to work or frequent exercise and are stabled on full feed often develop compaction colic. Neglect in watering or cold weather causing the horse to drink sparingly making an insufficient supply of water for proper digestion often causes compaction colic. Dry dead grass frequently causes compaction colic. Defective teeth, predispose to compaction colic.

SYMPTOMS

Probably to the observing individual the first noticable symptom is the horse lagging on the halter when led or lagging in the single tree when hitched. This form of colic more often but not by any means always, attacks older horses, frequently it attacks the new-born foal, which is dealt with under "The Care of the Young Colt."

In this form of colic the food fails to make its proper passage through the intestional canal. The horse gives signs of abdominal pains by looking around to the side or rear flank. They paw and may or may not lie down occasionally. These symptoms may be distinct or very

mild. If any passages are thrown off from the intestional canal, they are less than normal, and often are covered by a dirty white mucous.

As the case proceeds, the symptoms become more distinct, and the horse usually drops the head and may break out in a sweat, more distinct at the base of the ears. It is not necessary that all mentioned symptoms be present for horses to have compaction colic, and others not mentioned may be present.

TREATMENT

This should begin as soon as the first symptoms are noticed. Give the horse an injection by the way of the rectum of ½ to 2 gallon of luke warm soap suds water that has previously had ¼ pint of common salt mixed in it. Too strong soap suds may cause unnecessary irritation. The amount to inject depends on how it is retained. If the horse retains ½ gallon that is enough if given 2 or 3 times every 24 hours. If little is retained more should be used and used oftener. Good injections can be made with a 10 cent tin funnel and 3 feet of rubber gas tubing well oiled which can be bought at any drug store, a ¼ inch rubber tube is best. (See cut of necessary instruments page 18, fig. 7). I do not favor bucket pumps for this purpose.

MEDICAL TREATMENT

There are 2 objects in view in Compaction colic. I To pass the obstructed food through the canal. II To prevent inflamation of the intestional canal. To accomplish these is an art in the farming business. Linseed oil stands above all other drugs and remedies to soften the mass for it can be given in large quantities up to 4 or 5 quarts for horses weighing 1800 lbs. It does not induce inflamation of the bowels as calomel and many quick acting drugs. It does not leave the horse foundered as many of the quick acting drugs sometimes do when given in large doses. It is among the cheaper of vegetable oils. It will move the bowels without leaving the horse in a weakened physical condition. For the first dose give 2 quarts raw oil to horses weighing 700 to 1000 lbs. and 3 quarts raw oil to horses weighing 1000 to 1800 lbs. Every 12 hours give ½ the above amount and if the case is an advanced one give more at first. Continue giving oil every 12 hours till the horse's bowels move or 4 quarts @ 1000 lbs. is given.

A horse's bowels seldom act properly under 20 hours with Compaction colic and usually 4 quarts has to be given horses weighing 1000 lbs. before they move according to my experience.

To avoid inflamation of the bowels give with the raw oil 3 tablespoonsful of turpentine in the first dose and 1 tablespoonful every 24 hours @ 1000 lbs live weight thereafter, for 3 days unless recovery develops.

Some years ago a law was passed forbidding druggists selling [laudnium opium and morphine] to the public. There never was any thing better ever happened. Such drugs kill pain for a time its true they are good to deaden nerves running to the bowels, and stop the bowels from acting the very thing we're trying to get them to do, hence in such cases they are of no value. If the horse is in misery give him the following formula which will act in 20 or 30 minutes.

Fluid Extract of Capsicum, 1 dram (1 teaspoonful)
Tr. Nux Vomica, 1 dram (1 teaspoonful)
Chloroform, 2 drams (2 teaspoonsful)
Tr. Cannabis Indica, 2 drams (2 teaspoonsful)
Water, 1 pint.

The above is one dose and can be purchased mixed in any desired quantities and 6 teaspoonsful given at a dose in 1 pint of water.

A horse should receive no feed until the bowels move in this form of colic, but should receive all the water they will drink. Other remedies sometimes used in this form of colic but to my mind inferior are 1 lb. salts; 6-10 drams (6-10 teaspoonsful) Aloes.(Do not repeat). Aloes will physic but it also causes intestinal cramps. I object to salts because it is inducive to inflamation which we must guard against in this form of colic.

It may be necessary in case of bloat to puncture back of the last rib to relieve the horse of gas and pain. Always puncture at the highest point of the greatest distention usually on the right side but it may be on the left. A little instrument called the trocar (See instrument cut page 18, fig. 8) or a hollow needle are very useful for this purpose, since they leave a hollow tube in the horse and the opening of the skin and intestines cannot get out of line and stop the escape of gas. Drug houses handling veterinary instruments and mail order houses have these for sale.

The instruments and place of puncture should be washed well with dip or carbolic acid solution before the puncture is made.

Feed no solid food such as corn, hay, oats, etc. for a few days.

Some report good results in treating compaction colic with ammonium carbonate. It is cheaper than raw oil but its dependability has not been well established. With it barb aloes is used and it sometimes

colics a horse in itself; however this is not as true in horses sick with colic as well ones.

With the Ammonium Carbonate treatment give first

Turpentine, 1½ ounces (3 tablespoonsful)

Nux Vomica, 1 dram (1 teaspoonful)

Water, 1 quart.

The above may be given with a drenching syringe. In fifteen minutes give in a capsule or bran and molasses ball 1 ounce of barbadoes aloes. For a 1500 pound horse give every fifteen minutes in a capsule 1 ounce of ammonia carbonate until 3 or 4 doses have been given. Then give no treatment for 6 hours except repeat the nux vomica in teaspoonful doses every 2 hours. At the end of 6 hours, if good bowel action is not heard, give two more doses of ammonium carbonate 30 minutes apart, and so on until recovery.

Eserine in ¾-1 grain doses injected under the skin, has been used by Veterinarians in Europe for many years but I do not favor its use since rupture of the stomache too often follows in a few minutes after it is injected.

I do not advise the use of eserine only in the most obstinate cases. It is a very quick acting drug and may save the life of a horse that has been given up to die. Eserine should not be given pregnant mares and should always be injected under the skin and never given by way of the mouth.

WIND COLIC

Wind Colic [Flatulent Colic] [Gastro Tymphany].

Wind Colic is caused by the horse eating foods which form gas while undergoing digestion.

Among the more common of such foods are clover pasture, alfalfa, new corn, new oats, musty or moldy feeds. If this form of colic is from grain it is likely to prove fatal unless proper treatment is quickly given.

SYMPTOMS AND TREATMENT

A horse effected with this form of colic in a severe case goes through all the symptoms of pain a horse knows how to exhibit. The pains are continuous and often a bad odor is detectible at the mouth. Before the case has gone very far the horse gets better or bloating begins, due to gas forming in the bowels. The horse often assumes a sitting

position as a dog. In most cases the bloating occurs above the right flank but may be above the left flank.

If bloating is severe, puncture at the highest point of greatest distention with a needle or trocar (see cut page 17, fig. 8) previously dipped in carbolic acid or dip solution. If neither are available puncture with a knife and insert a hollow pipe stem, or shue-mack and secure it so the stem can not get into the bowels. If the tube is not inserted the movements of the intestines will throw the puncture of the bowels out of line with the skin puncture and the gas will stop escaping. Do not give the horse water to drink.

Chloral Hydrate is the best drug known to stop gas accumulation besides being an autispasmodic to releive pain. Give 1 ounce (2 tablespoonfuls) in 2 quarts of water every 2 hours till the horse is relieved, or 4 or 5 doses are given. This irritates the throat if not well diluted with water. In addition to Chloral Hydrate 2 quarts of raw linseed oil and 4 tablespoonsful of turpentine should be given. Any of the following are of benefit to stop gas forming: baking soda 2 ounces (4 tablespoonsful), solution of 10 per cent amonia, 1 ounce (2 tablespoonsful), tar 2 ounces (4 tablespoonsful).

Any or all of the above may be given, every ½ hour, or sulphuric ether may be given in ½ ounce (1 tablespoonful) dose every ½ hour. The following colic prescription is excellent to relieve pain and has a tendency to stop the formation of gas.

Fluid Extract of Capiscum, 1 dram (1 teaspoonful)
Nux Vomica, 1 dram (1 teaspoonful)
Chloroform, 2 drams (2 teaspoonsful)
Cannabis Indica, 2 drams (2 teaspoonsful)
Water, 1 pint.

It can be given every 30 minutes until pain ceases, or a number of doses are given. 1½ to 2 pints of lard melted and allowed to cool given every 3 or 4 hours as a slow drench is often beneficial to stop gas formation.

CRAMP COLIC

Cramp Colic [Spasmodic Colic].

CAUSES

This form of colic derives its name from the fact that the intestines form spasms. This is probably the most frequent form of colic. It may

be caused by sudden change of feed, drinking cold water or sudden change of body temperature or allowing a warm horse to cool off suddenly. Hence it is more likely to occur in spring or autumn.

SYMPTOMS

The horse looks to his side. The pains are brief (intermittent) and often severe. The intestinal murmurs are louder than in the healthy horse.

The loud noise is probably due to the contraction of the intestines and the presence of gas.

TREATMENT

Remove the horse to an even temperature and do not give any feed and give water sparingly till recovery. The following formula is good.

Nux Vomica, 1 dram (1 teaspoonful)

Fl. Extract of Capiscum, 1 dram (1 teaspoonful)

Chloroform, 2 drams, (2 teaspoonsful)

Cannabis Indica, 2 drams (2 teaspoonsful)

Water, 1 pint.

Give every 30 minutes until releif or several doses are given.

Chloral Hydrate 1 to 1½ ounces given every 2 hours is an Anti-Spasmodic and good in this form of colic. Give it in 1 quart of water since it will irritate the throat membranes if not well diluted. Soaking oats before feeding will often keep them from colicing the horse. If permanent releif is not obained after a few doses of the above prescription are given it is very probable that a compaction exists. The above is as good as any prescription to stop pain and where it fails it is usually due to a compaction. The treatment for compaction is given under that particular form of colic.

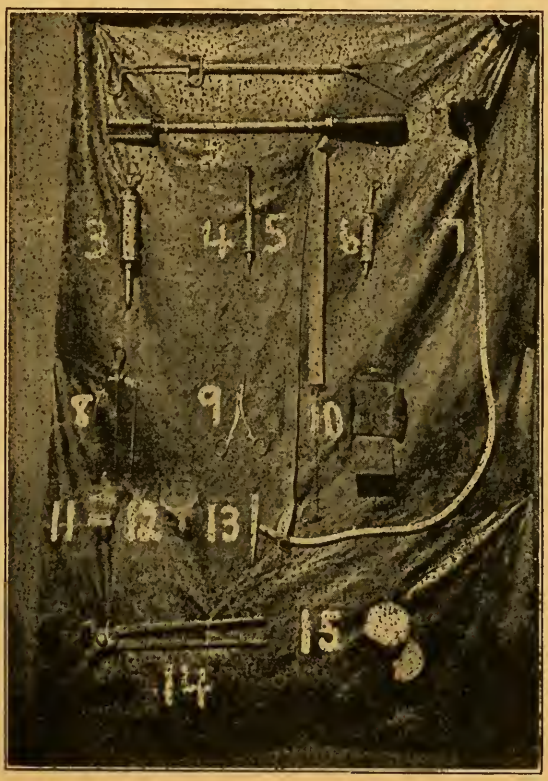
DRENCHING

Drenches are best given with a syringe. Fig. 3. page 17. If a horse has too much of any fluid in the mouth they can not swallow and it is likely to get on the lungs and kill the horse. A horse can be made to swallow by placing a little water up the nostrils.

CONVENIENT INSTRUMENTS

A group of convenient and valuable instruments to have on any farm.

1 Pig forceps.
2 Tooth float for cutting away the sharp edges of horses teeth.
3 Dose syringe for drenching.
4 Needle syringe for injecting medicine under the skin.
5 Rubber ligature to check circulation in snake bites and stop bleeding.
6 Syringe for cleansing surface cavities.
7 Rubber tube and funnel used for douches in cattle and horses.
8 Trocar and canal used to puncture the abdomen filled with gas, the part on the right remains in the animal.
9 Artery forceps used to stop bleeding and in sewing.



10 A case of various shaped needles.
11 A convenient measuring glass marked in teaspoonsful.
12 A glass funnel.
13 Forceps.
14 Pincers for hoof clipping and tusk removing.
15 Cobbler's sewing thread and bees wax.

INDIGESTION

This is an inflamation of the mucous membrane lining the intestinal canal. The mucous membrane is covered with a slimy mucous and on portions of the canal the membrane is sometimes entirely destroyed giving the membrane the appearance of being ulcerated.

CAUSES

Poor teeth causing improper mastication of the food. When worms accumulate in large numbers they may cause injury to the intestional wall and cause indigestion. Musty or moldy feeds continued for some time will sometimes cause indigestion. Some horses naturally have weak digestive tracts and develop indigestion at the first opportunity.

SYMPTOMS

Often times it is difficult to be positive that the horse hasn't got compaction colic. But usually the horse will have previously exhibited some of the following symptoms. No fever is present, in the chronic form the horse has a pasty and coated tongue, grates the teeth and may show dizziness or colicky symptoms. Irregular appetites usually preceed the attacks and the horse prefers unwholesome food as bedding etc., to pure food.

Constipation and diarrhea often alternate, with a sour and offensive odor. The abdomen is noticeabley tucked up or becomes excessively large. The horse is dull and stupid which may preceed the attack. The feces are hard and often contain whole indigested food and mucous.

TREATMENT

The diet is most important in this disease. Until recovery the horse should receive only a mixed ration of

Ground Oats, 5 parts

Bran, 5 parts
Oil Meal, 1 part
all mixed and scalded 12 hours before feeding. The horse may be fed some cut alfalfa or clover hay.

If constipated, mix 1 tablespoonful of the following in each feed.
Glauber's Salts, 2 pounds
Salt, 1 pound
Baking Soda, ½ pound.

Often rectum injections given as recommended in compaction colic on page 12 are to be recommended in indigestion if constipation exists. If diarrhea is present 2 tablespoonfuls of tannic acid may be given 2 times daily in ½ pint of water. The following by some people is believed to be good for diarrhea.

Get 2-3 quart of live white oak bark peel off all the dead bark. Steep the bark in 4 quarts of water, strain off the liquid and mix enough wheat flour with it to make a thin paste. Add 3 or 4 teaspoonsful of nutmeg and give the horse 1 pint 2 or 3 times daily.

Common white starch made to a creamy constituency and give 2 or 3 pints 2 or 3 times a day as a drench and an equal amount injected with a syringe into the rectum is very good for diarrhea.

I prefer to give 1 dram, 1 teaspoonful of creolin in 2 quarts of water every 8 hours. Creolin must be given in oil or well diluted.

INFLAMMATION OF THE BOWELS

There is danger of colic terminating in inflamation of the bowels unless proper precautions are taken. Inflamation of the bowels may develop from poisons or irritating feeds, or it may follow colic caused by a hard drive or severe work. If the horse scours with an offensive odor after colic, it is well to be on guard for inflamation of the bowels.

SYMPTOMS

At first the horse is apparently not very sick. The mucous membrane of the eye is red and inflamed, and the horse generally flinches when pinched over the intestines.

TREATMENT

Do not try to feed the horse anything but cooked gruels, milk or bran mashes till he has recovered and feed that very sparingly. Give the following every five hours until improvement occurs.

(1 teaspoonful,) 1 dram gum camphor

(2 teaspoonsful,) 2 drams chloroform

1 pint raw linseed oil; or give 1 pint castor oil in a thin flour or starch paste every 5 hours.

SPECIAL FEEDS FOR SICK HORSES

Gruel and Feeds good for Horses with Digestive Troubles

Small quantities of green (not dead) grass. A bran mash made as follows is good: Take 3 quarts of bran with 2½ to 3 pints of boiling water poured over it in a clean recepticle and add one tablespoonful of salt, allow it to cool and feed.

Linseed Tea

Boil 1 pound of linseed in two gallons of water till the seed is soft.

Oat Meal Gruel

Add 1 pound of oat meal to 1 gallon of water and bring to a boil. Allow to cool and feed.

Scalded Oats

Pour boiling water over the amount to be fed. Allow it to cool and feed.

Milk

May give as much as 2 qcarts to 3 gallons a day pure or dilluted one-half with water.

Flour Gruel

Place ½ pint of flour in equal parts of water and stir, add 3 to 4 quarts of boiling water, fill the bucket full of water and give to the horse luke warm, 6 or 8 gallons a day may be given.

CHOKE

Choke sometimes occurs when horses are eating oats, dry straw, chaff or it may be caused by horses trying to swallow from a low feed box, distemper, or improper chewing of the food. Sometimes rags which require an unusual amount of saliva are swallowed and will not be received by the esophagus and gullet and cause choke.

SYMPTOMS

The higher the choke the more severe the symptoms.

The horse coughs and whatever he attempts to swallow is often returned by the way of the nostrils. Breathing some times becomes so difficult that enough air is not taken into the lungs to prevent suffociation. If difficult breathing is of very long duration the abdomen becomes distended with gas.

TREATMENT

If the horse bolts his feed choking can often be prevented by spreading the feed out in a long manger. If bolting is due to the teeth, have them treated.

If the choke is in the Esophagus (high choke) it can often be reached by hand. By having an assistant, press the choke as high as possible, run the hand back in the mouth by holding the thumb against the roof of the mouth with the little finger against the tongue and remove the choke by pulling it out or pushing it on down.

If a light piece of flexible metal can be obtained that can be bent and a 2 inch thick, tough block procured, a gag can be made by fastening the spring to the block and bending so it will clamp tightly on the horses cheek while the block rests between the molars preventing the horse from closing his mouth. The object of the spring is to prevent the horse from throwing the block out or between the molars. Such a gag can be purchased. The giving of raw or castor oil will usually remove a choke.

A lower choke can often be removed by hand manipulation from the outside. Especially is this true when choked on articles of food. A piece of small oiled rubber hose is best to pass down the horses throat to remove a choke that can not be removed by hand manipulation. The hose does not irritate. Pliable whip stalks should not be used unless

the end is covered to prevent the rupture or irritation of the walls of the throat. A probang may be used but it is much more dangerous than the former method. To make a probang, take a piece of whip stalk fastening securely a sponge or piece of soft leather on it and tie a smooth string to it so if it gets loose it can be pulled out. Oil it well with vegetable oil, insert the probang easily and gently into the gullet and push the obstruction on down. If this work is not done gently there is danger of ruptureing the walls of the oesophagus or gullet.

In case of suffocation it may be necessary to perform an operation known as Trachenomy.

This operation consists in slitting 2 or 3 inches of skin of the throat over the trachea and splitting a portion of two of the Cartlidges of the trachea lengthwise. Do not split the joints. Hold the opening open by a cord and hooks run over the neck. Do not wait till dangerous bloat or suffocation develops to let the air in the trachea below the choke. If the wound is washed daily with a mild antiseptic, healing should not be difficult. Make the incissions square in front so the arteries will not be cut.

FOUNDER

("*Laminitis*")

Founder may be caused by chill or too large a dose of a medicine given for the purpose of physicing

This disease is a product of indigestion settling in the tissue.

Give the horse luke warm water to drink and light diet.

One pint of raw linseed oil given to clean out the bowels should prove beneficial. Powerful physics are to be avoided in all cases. Hot or cold foot baths are to be recommended. Stand the horse in a tub of water just as hot as the horse can stand it for half an hour twice daily or pack the feet in ice. This is done to induce the blood to the feet in its effort to equalize body temperature and this aids to carry away the pus of the tissue. If the founder is a bad case it may be necessary to cut through the frog and let out the pus. Such an incission should be kept well disinfected daily or healing may be difficult.

INTESTINAL WORMS

Nine cases out of ten it is the small or large round worms that cause the trouble in the horse.

Occasionally tape-worms are met with and some people believe bots (another intestinal parasite) causes more or less annoyance. Worms not only eat the food which the horse has gathered for nourishment but if they get too numerous they may injure the wall of the intestinal canal causing indigestion.

The horse has a ravenous appetite but fails to improve in condition if he has become poor. Horses may have many worms in the intestines and not become poor. Whitish discoloration sometimes develops under the tail around the opening of the anus. A few or many worms may be seen mixed with the bowel passages. Light, colicky attacks are sometimes due to worms.

TREATMENT

Good results in treatment of any animal for worms can not be expected unless the medicine is given on an empty stomach and the worm medicine is accompanied or followed by a physic.

The medicines given seldom kill all the worms but numbs them and they must be thrown out while they are stupid hence the necessity of the loose condition of the bowels. Following are a few of the better worm treatments for mature horses of 1000 pounds of weight. Any of them may be given to heavier horses or colts if given in proportion to the body weight. For a 2000 pound horse it would not be wise to give twice as much as you would to a 1000 pound horse, probably one-half to two-thirds more should be given. Again a yearling colt weighing three hundred pounds should receive a little over one-third of a dose. The above rule will apply to the administration of most medicines. The condition, weight and age largely determine the dose. A thin animal with as much intestinal surface as an animal in good condition should on an empty stomach to obtain results.
receive almost as large a dose. Horses should have worm medicine given

Turpentine is a good drug to give for most any kind of worms except bots (which are intestinal paresites) if kept up long enough. To a mature horse give 3 ounces (6 tablespoonsful) in 1 pint of raw linseed oil daily for 10 days.

A good worm ball for all kinds of round worms is:

Barbodoes Aloes 1 ounce(2 tablespoonsful)
Calomel 35 grains (½ level teaspoonful)
Santonin 60 grains (1 level teaspoonful)

mix with sufficient bran and molasses to make a ball and place the same as far back on the tongue as possible with a long handled spoon or balling gun. The above may be given in capsules. Repeat the treatment in one week. Aloes frequently causes horses to have colicky pains.

Powdered nux vomica, 2 ounces
Powdered gentian root, 4 ounces.
Powdered areca nut, (fresh) 6 ounces
Common salt, 4 ounces
Arsenious acid, 2 drams.

Give 1 teaspoonful to every 250 pounds of weight. Give no feed 24 hours before the first dose and repeat every night and morning for 1 week, giving very little feed. Most horses will eat this formula in 1 pound of ground feed.

A treatment which I prefer to all others for round worms in horses is tartar emetic. Give one dram once or twice daily on an empty stomach in a bucket of water or in a little feed. Keep this treatment up for 5 or 6 days. I usually give it in the morning after the horse has had no feed for 12 to 14 hours and again before the evening feed. 3 to 4 hours after the last dose is given, physic the horse with

½ dram of Calomel.
6 drams (6 teaspoonsful) of Barbadoes Aloes,

give the above in a capsule or mix with bran and molasses and place as far back as possible on the tongue with a long handled spoon or balling gun. Don't expect results and give the drugs on a stomach containing food.

Bisulphide of Carbon, 2½ drams
Raw Linseed Oil, 1 ounce,

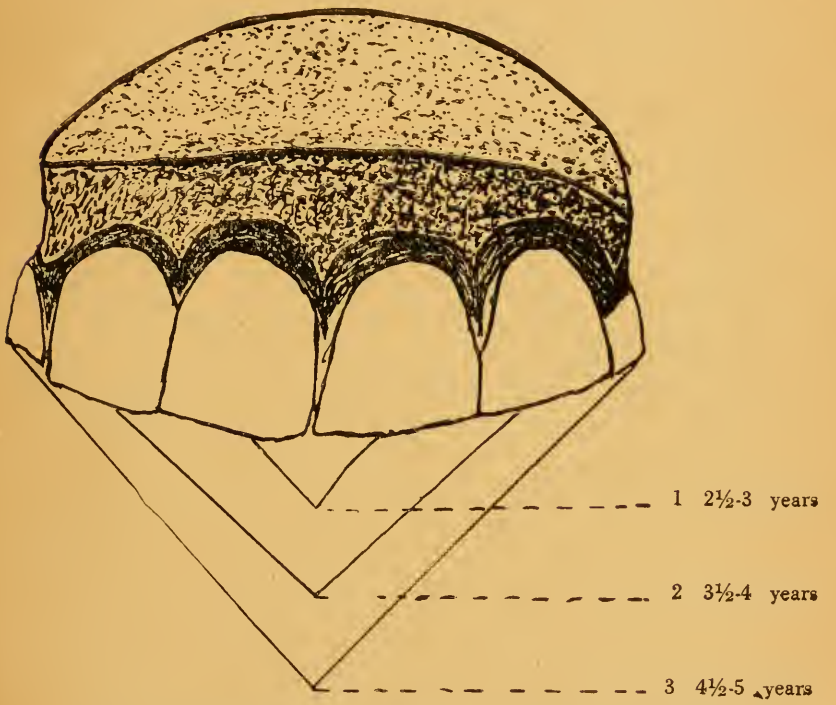
give 3 doses two hours apart followed by a physic.

The above formulae is the best one known to remove bots, and it is best to give it in the autumn when the bots are immature. Carbon bisulphide colicks some horses which can be prevented by walking them for an hour after they receive the medicine.

THE TEETH

Probably no portion of the horse's anatomy will effect the general condition of the horse as quickly as poor teeth. Horses that hold their

heads sideways, eat their food ravenous, stop drinking suddenly, slobbers at the mouth, have a bad breath, or are poor in condition should have their teeth examined. One reason the teeth are sadly neglected is because many do not know what to look for and often-times do not know how to look for the trouble. Place the horse's head toward the sun, secure the tongue in the left hand by reaching the hand into the mouth between the nippers and molars and pulling the tongue gently out of the mouth. The front teeth or nippers in horses that are cutting their teeth may come in crooked if the milk teeth do not shed or (come out) soon enough. In

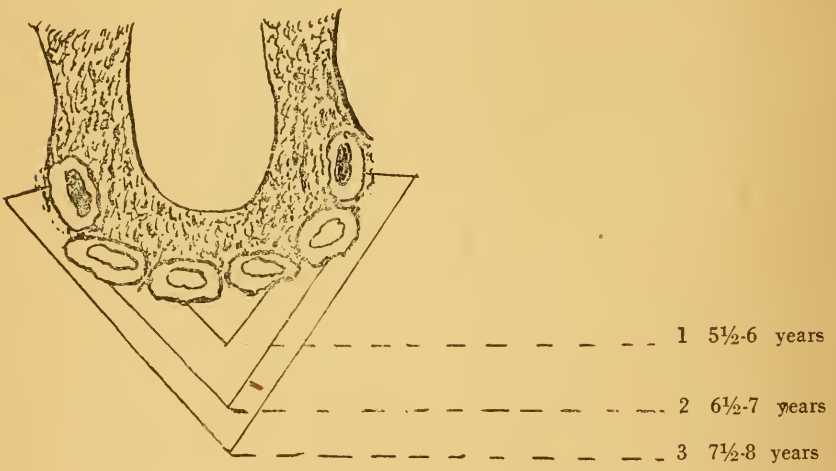


(Cut showing the order in which the permanent teeth appear.)

case this happens pull the milk teeth out of the way. This can often be done with an ordinary pair of pinchers. The permanent teeth have cups in them and are larger than the milk teeth. Sometimes the milk teeth do not come through and the colt can not hold the teat of the mare and is necessary to make an incision in the gums with a knife over

the teeth to help them through. Probably the most common trouble with the teeth of the horse is due to uneven wear. Nature for some cause provided the horse with a wider upper jaw than lower. As a result the upper and lower molars wear off uneven. The upper molars wear to a sharp edge next to the cheek and may cut the cheek. The lower molars wear long and sharp on the inside and may cut the tongue, as the horse chews his food. In such cases the sharp edge should be made blunt by a special file called a float (See cut of instruments on page 17, fig. 2) Float the lower incisors and molars on the inside and the uppers next to the cheek.

Sometimes a molar gets knocked out or decays and falls out or breaks off. In such a case the tooth opposite has nothing to wear against and



(Cut showing the order in which the cups wear away in the permanent teeth.)

continues to grow long and finally wears against the tender gum and none of the teeth can come together. As a result the food can not be chewed and the grain may pass through the horse unground. In this case every few months it is necessary to clip such a tooth off level with the other molars.

THE KIDNEYS AND URINARY ORGANS

The function of the kidneys is to eliminate water and other wastes from the body.

Probably no organ of the body is so quickly effected by the disorder of some other organ of the body as are the kidneys. Digestive dirorders, liver disorders, disorders of the gall and even nervous disorders reflect themselves in disorders of the kidneys. This is because of the extra work required of the kidneys.

The color of the urine of a healthy horse depends largely upon the kind of feed they are receiving. On grass the urine is white probably due to salt deposits. On hay, corn, and oats it is amber color with a distinct and characteristic odor.

EXCESSIVE URINATION

Otherwise Known as (Diuresis, Diabetis Insipidus, or Polyuria)

CAUSES

Excessive urination is caused by new or musty oats, hay or other musty feed. This disease is therefore more frequent in wet seasons. Millet hay is particularly liable to cause this disease. Harmful drugs in stock powders or patent feeds are frequent causes.

SYMPTOMS

Horses may drink as much as 18 gallon of water a day in hot weather when effected with this disease and urinate as much as 12 gallons a day

Often the disease is mistaken for colic for it frequently happens that the horse has colicky pains and symptoms. The horse gets hollow in the flanks, gets thin in flesh, the hair stands erect, and loses its luster, the eyes are sunken and after running for some period the horse gets sluggish.

TREATMENT

The most effective treatment is to remove the cause, which is usually located in the feed.

I have had cases where the horse could not receive oats or grass without becoming noticeably worse. Again I have had cases other years that could not eat oats, clover, or millet hay without becoming worse.

I have never seen a horse with excessive urination that did not improve on timothy hay, prairie hay and corn.

One can not expect satisfactory results and continue to feed the feed causing the disease. The first thing to do is to change the horses feed, feeding sparingly till he becomes used to the new feed. After 10 days to 2 weeks, one will be able to tell whether the ration is or is not an agreeable one. I have had the best results in dealing with urinary troubles to get an agreeable ration. In chronic cases of long standing give 1 dram (1 teaspoonful) of potassium iodide for 7 days, omit 7 days and unless marked improvement has occured during the 14 days; repeat the drug for another 7 days.

DIFFICULT URINATION, SUPPRESSED URINATION

(Stone, Gravel, or Urinary Calculi)

Suppressed urination may be caused by a dirty sheath in horses which may be overcome by washing with soap suds well up in the sheath. Suppression of urine may be caused by paralysis of the bladder. Stone of the bladder is seldom found east of the Mississippi river. It is common where the grass and water contain considerable calcium carbonate which is limestone. Limestone goes into solution very slowly. It may settle in the bladder in the form of a stone and require removing by paring or can sometimes be washed out. External stone calculi occasionally appear on the face the size of a nut and are easily removed by cutting them out.

SYMPTOMS

The horse shows colicky pains. The urine is passed in small amounts or may be totally suppressed. By placing salt on the penis of the horse or vulva of the mare, they will usually try to urinate. When urine is suppressed the animal strains. It is possible to run the oiled hand into the rectum and determine whether the bladder is or is not distended and often if one or more stones are present they can be felt. By feeling through the vulva it is often possible to enter blunt forceps through the bladder opening and secure the opening to the bladder of the mare located 3 inches inside the vulva on the lower part of the cavity

exactly in the center of the passage way to the womb. No medicines that I know of are of decided advantage in removing stone from the bladder or uretha.

Following are some of the more common drugs used by some people for kidney troubles of the horse, none of which I recommend.

Sweet Spirits of Nitre 1½ ounces (12 teaspoonsful) @ 1000 pound live weight, this may be repeated in three hours for several doses. Give each dose in 1 pint of water.

Turpentine 6 to 10 drams (6-10 teaspoonfuls) may be given in water, two thirds of a dram (two thirds of a teaspoonful) of creolin may be given in 1 quart of water.

INFLAMMATION OF THE KIDNEYS

("*Nephritis*") ("*Dropsy*")

Various kinds of colic, (more often Compaction colic) are often confused with kidney disorders.

Nephritis is probably the most frequent form of kidney trouble and is not infrequent. It effects both horses and cattle.

CAUSES

This disease is attributed to kicks, blows, strains, over exertion, lack of opportunity to urinate etc., but it is my opinion these are only factors that bring about the culmination of the chronic form of the disease, and that the real cause is to be found farther back.

Sickness such as Rheumatism or skin diseases which throw extra work on the kidneys because the bowels, blood, or skin do not function properly may be given as a cause. Millet, alfalfa and clover hays may be given as feeds causing extra kidney work.

Drug doped feeds, stock powders and often drugs themselves as turpentine, croton oil, etc., are irritating to the kidneys and might cause the disease.

A stagnant water supply would cause excess work. It is possible the bacteria which the kidneys are required to throw off might cause inflamation to develop.

SYMPTOMS

There is the chronic and acute form of nephritis. The acute as I have observed the disease is the termination of the chronic. The chronic form more often manifests itself in as much as several days of suppressed urination or the urination may be frequent and of a deficient amount. These may be the only noticeable symptoms in some cases.

In the more acute form the horse takes ill quite suddenly, becomes weak and if exerted lays back, wabbles, rolls and may fall in the harness. Such an attack usually occurs after a period of rest following heavy work, hence the name, "Monday Morning Disease" given it in the cities. During the rest on heavy feed, the intestines have not done as much work and extra work has been thrown on the kidneys. However such a disease might occur on Wednesday or Thursday.

One or all of the following symptoms may be present: colicky pains, weakness, loss of appetite, rise of fever, straggling gait, or head back and difficulty in rising when down. The legs, joints, abdomen and even the belly may be puffed out with a dropsy like swelling. By inserting the oiled hand in the rectum of the horse or vulva of the mare no urine is to be found in the bladder. The last two symptoms are different from those found in inflamation of the bladder. In inflamation of the bladder dropsy is not present and often the bladder is full. The urine is thick, slimy and highly colored in nephritis. They do not always flinch when pressure is applied over the kidneys.

See also Congestion of the Lungs.

TREATMENT

Do nothing to exert the horse, blanket them and apply hot cloths over the kidneys. Do not give or apply externally lineaments, turpentine, croton oil, gasoline or any drugs that will irritate. A quart to one and one-half quarts of raw linseed or castor oil may be given to keep the bowels open and take work off of the kidneys. Give all the sweet milk they will drink and make it the chief food. Give some grass timothy hay and oil meal but very little grain. Give the horse plenty of water several times daily. If they do not drink pretty plenty of water some salt may be added to increase the thirst. The chief things to do are to give the horse lots of rest avoid irritant drugs and foods and give close attention to the diet. A horse effected may never have another attack or it may reoccur.

INFLAMMATION OF THE BLADDER

(Cystis)

Inflamation of the bladder may be caused by drugs as turpentine, spanish fly or resins which interfere with the free passage of urine or irritate. Stone calculi may cause inflamation of the bladder. The basis of bladder inflamation is bacterial infection so it might be caused by bacteria thrown off from the diseased blood as in rheumatism, fevers, etc. infection often develops when catheters (an instrument used to drain water from the bladder) are used without previous boiling for 10 to 15 minutes. Inflammation may arise from any cause which will suppress the urine, irritate or carry infection to the bladder.

Colicky pains are present but the frequent and deficient amount of urine passed distinguishes it from colic. The urine may contain blood, pus, or fibrous tissue and often has an offensive and characteristic odor. The exact character of the urine is best determined by catching a small portion in a bucket and pouring in a tall, clean, clear bottle. By exerting pressure on the bladder after introducing the oiled hand in the rectum or vulva great tenderness of the bladder is evidenced. Sometimes the bladder is filled and sometimes it is empty.

TREATMENT

When the bladder is full it must be emptied by the use of a previously boiled catheter remembering that sterile instruments are absolutely necessary in working about the bladder.

Until the inflamation is checked the bladder must be washed out two times daily with 1 teaspoonful of boric acid dissolved in 1 quart of water. This can be done by use of a long rubber catheter and inserting one end in the bladder and holding the other end above the level of the bladder. If stone calculi are present they are probably the source of the inflammation and should be removed. Give the horse milk as the chief diet. Keep the bowels open with raw linseed oil. ¼ to ½ gallon may be given for each 1,000 pounds live weight.

To keep the bowels open takes work off of the kidneys. Grass serves the same purpose if green. Do not apply blisters but use hot cloths over the loins. If the case has a tendency to become chronic, give daily 1 dram, (1 teaspoonful) of Nux Vomica and ½ dram (½ teaspoonful) of Buchu.

REPRODUCTION

The normal period of pregnancy in the mare is eleven months, but cases are on record where the foal was not born for 18 months after the dam was bred. Twelve months is nothing unusual. There are various reasons offered for prolonged generation. The two that look the most reasonable to me are as follows: I It takes longer for some individuals to develop to a state where the lungs and other organs are in proper form to perform their function without the aid of the parent stock. II The second logical reason is the fact that it is possible for the sperms of the stallion to live in the womb of the mare many days before the egg of the mare mixes with or fuses with the sperm of the stallion. I have observed in warm weather sperms from the stallion kept at body temperature for 24 hours and apparently just as motile as when they left the body of the stallion.

NATURAL FOALING OR PARTUATION IN THE MARE

Birth may be given to a foal with the mare standing or lieing down hence the neccessity of bedding in a barn. After two or three pains in normal foaling the water bag bursts, and the fore feet protrude with the nose resting between the knees, with a few more pains the colt is born. The whole operation often consumes less than ten minutes..

CARE OF THE YOUNG COLT

The big breeding establishments of Ia., Ill., Minn. and other states keep men in their breeding stables both night and day during the foaling season, to give the proper care to the new born foal. I do not advocate this as a practical plan for the diversified farmer, but from the big breeders experience we may well pattern a few lessons. One of the first duties of these men after a colt is born is to see to it that the membrane which the new born colt carries over his body does not extend over the nostrils thus causing suffocation.

These men are there to see to it that the colt does not bleed to death from the navel. When bleeding occurs they have cords previously saturated in carbolic acid, creolin or a good dip made by use of ½ pint disinfectant to 1 gallon of water. With this string they tie the navel and stop bleeding. The stump of the navel is emerged in one of the above solutions to prevent navel ill which should be repeated in 10 or 12 hours.

NAVEL AND JOINT ILL OF THE COLT

("*Septic Arthritis*")

In the last ten years navel ill has probably cost the farmers of the corn belt more money than all other diseases of colts combined. It is reasonably easy to prevent in many cases and very difficult to cure if curable at all. Some men think it possible for colts to develop navel ill while in the womb of the mare. However this has not been definitely established to date. Most men who have experienced with the malady believe in most cases the germ enters the colt's body by the way of the navel. Consequently to submerge the colts navel in a carbolic acid or dip solution and tie it will prevent the germs from entering the body. This should be done soon after birth.

It occurs more frequently in foals born in barns or barn lots of infected premises than those born in open fields. It is much more desirable to have the colt born in open, well drained pastures if possible since the germs do not thrive well in open dry surroundings, but sometimes this is impossible and in that case the stall should be cleaned where the colt is to be born and should be thoroughly sprayed with a solution made by mixing one-half pint of dip, carbolic acid, or creolin in 1 gallon of water or 1-500 soluton of bichloride of mercury solution. The latter is very poisonous and none of the pills or liquid should be left where they will be taken inwardly by man or beast. Then sprinkle air slacked lime on the walls and stall to absorb moisture and kill disease germs. Then apply a good bed of wheat or oats straw and clean the stall daily. A stall should be disinfected two times a week.

A colt may become effected with navel ill any time before the navel heals up but symptoms may not appear till after the navel is healed. The colt may seem indifferent to nurse as the first symptom, become lame in one or more joints. The lameness may shift from one joint or one limb to the other. A purlent semi liquid pus may be noticeable around the navel stump. Then we notice swelling in the joints and console ourselves by thinking the colt has been kicked or the mother has stepped on the joint but finally the swelling breaks and a whitish yellow discharge comes from the joint and the wound fails to heal. The colt may lay or limp around for several months and not grow right or they may die in a very few days. In rare cases they live and get well.

TREATMENT

Iodine is the best drug to paint the navel and joints with, but all the treatment of every veterinarian is not as effective as to keep the colt away from infected barns and lots. There is a bacterin on the market for navel ill but to date it is only an experiment. However, on infected premises the bacterin have given good results when injected before the disease establishes itself. That is, healthy colts can be kept from taking the disease by immuning them with the bacterin.

DISCHARGE OF URINE BY WAY OF THE NAVEL OR

[*"Persistent Urachus"*]

Discharge of urine through the navel opening more freqcently happens male than female colts. It is caused by the non-closure of the channel through which water passes during pregnancy.

Water runs or continually drips out of the navel cord and if allowed to continue for any length of time irritates the surrounding parts.

TREATMENT

This is compartively simple if a stump of the navel cord remains. Tie a previously disinfected soft cord around the stump and the openng will close. If none of the cord remains prepare a cobblers sewing thread by doubling and waxing it with bees-wax or rosin; place it in the needle; begin at the back of the navel and run a stitch from the back of the navel to the front and tie it, completely closing the opening and involving no more skin than is necessary. Then if urination does not go through the proper channel it may be the channel is closed in the uretha. In such a case it is necessary to open the channel with a human catheter. The sooner the above operation is performed in a case of navel urination the more successful will be the result.

CONSTIPATION IN FOALS

(*Costiveness*)

The bowels of a foal should be observed very closely the first few hours after birth. Failure of the bowels to work properly causes the loss of many colts annually. When the bowels fail to move it is usually due to the first milk taken failing to act as a laxative on the bowels. The food of the mare prior to foaling may change the composition of the first milk. A ration composed of too many dry feeds with lack of exercise, feeds as corn and timothy hay have a tendency to cause costiveness. Stock powders, sometimes contain drugs which have a very deterimental effect on the composition of the milk. Sometimes drugs given in disease have such an effect on the composition of the milk. Grass and oats with a little linseed oil meal makes a good ration for a brood mare.

Sometimes a stagnant water supply has a very bad effect on the young foal. It sometimes happens that the mares udder is diseased. From my experience I am prone to believe that most all intestinal troubles of the normal foal's bowels are due to the feed or water of the mother before or after foaling.

SYMPTOMS

When young foals are constipated they raise the tail quite often, as they would in normal bowel movement. The trouble is farther indicated by straining and colicky symptoms may be pesent.

TREATMENTS

See to it that the food and water supply of the mother are pure and as outlined above. A few injections of soap suds and water placed in a syringe and injected into the rectum of the colt usually soften the passages so the bowels will move.

I always give the colt an injection of about ½ pint unless I am posiive the bowels have acted. If the colt becomes a day or two old and the colt has had no passages it is often necessary to give them (2 or 4 tablespoonsful) 1½ to 2 ounces of castor or olive oil, repeat every 12 hours if necessary and give 3 to 4 soapy water injections every 24 hours from 1-3 to 3-4 pints depending on how much of the water is retained.

DYSENTERY

(Bloody Flux)

Diarrhoea

CAUSES

This is usually caused by feeding the mare too laxative, rich or irritable a feed. This disease may be caused by the mare having access to a foul water supply. The mare may have received a sudden change of feed. A diseased condition of the mare, exposure or allowing the colt to nurse when the mare is hot. Working the mare too soon after foaling may cause dysentery.

SYMPTOMS

The passages from the bowels are frequent and thin. The colt strains and shreads of blood are found in the passages in more advanced cases. The passages have an offensive odor. There may be lumps of feces in the passages. The colt gets weak and lies down a great deal.

TREATMENTS

A gradual change of diet of the mare is about the first thing to do if the mare has been receiving a diet of corn and hay without proper exercise or if the mare's colt has been allowed to nurse while the mare is warm see to it that this is remedied. If nothing is wrong with the diet or the care of the mare then, if possible, procure a mare giving milk about the same length of time and place the sick colt on her. A change of mothers may help. A good feed for the mother in this disease would be a bran mash with a few oats and a limited amount of clover and mixed hay. Check up all feeds for a few days. I have had very good results by giving 6 tablespoonsful of castor oil followed in 12 hours by securing ½ pint of white oak bark (get the inner bark of smaller limbs); steep it in 1 quart of water, strain it through a cloth. After the same cools add raw wheat flour continually stirring till a thin paste is formed then add 1 teaspoonful of nutmeg.

Give 3 tablespoonsful of the above 3 times daily till the bowels check. If the bowels check suddenly it will cause fever. In that case give 2 to 3 tablespoonsful of castor or olive oil every 12 hours. Sometimes oil (castor) is given for diarrhea followed by laudanum ½ to 1

dram and camphor 4 to 6 drops repeated every 4 or 5 hours. This has given me the best results in such bowel troubles. The causes and treatment of diarrhea in colts is very similar to dysentery or flux. Boil some white starch till a creamy constituency is obtained and drench the colt with ½ pint 2 or 3 times daily giving an equal amount with a syringe by the rectum. This will often overcome diarrhea caused by too much or too rich a milk. Reduce the milk supply and follow the starch once daily with 2 tablespoonsful of castor oil containing 5 or 6 drops of turpentine used as a drench. Bismuth sub-nitrate may be given in 1 to 1½ dram doses or the formulae recommended for scours in calves may be found beneficial for scours in colts.

DIFFICULT FOALING OR

(Partuation)

This more frequently happens when the foal is coming wrong or in mares that are under size for their breed and are bred to a large breed of stallion. However, it seems the mare has more to do with the size of the foal than the stallion. On ranches little ponies that are the average in size for the breed seem to encounter no particular difficulty when bred to draft stallions.

Delayed foaling after the operation begins is accompanied with more danger than in the cow since the whole operation often consumes less than 10 minutes, under normal conditions in the mare. The foal seldom lives more than 3 or 4 hours after pain begins.

Assistance to be Given

First of all turn the mare's head down hill with the hind parts raised for the purpose of pushing the foal back so it may be brought out in proper form. Let the operator lard the hands well. Also the body of the foal if possible. Then determine whether or not the foal has both fore feet and head up ready to come, if he hasn't, push him well back and straighten him out. It is dangerous and very difficult to try to get a foal born improperly presented. Push them away back in the womb and often the colt can be straightened and the foal and mare saved. Do not push while the mare is laboring. Merely hold what you have and push

between pains. It is possible for the colt to be born hind feet first but often difficult. If the mare suffers intense pain, 1 to 1½ ounces (2 to 3 tablespoonfuls of chloral hydrate may be given in 2 quarts of water every of water. An injection under the loose skin of the neck of 1 teaspoonful of patuitrin often is beneficial in aiding in foaling. The dose may be repeated in one hour. Some drug stores handle patuitrin.

When the pelvic bones are too narrow it may be necessary to render aid by pulling. Pulling should be done gradual and patiently only as the mare strains. The greatest diameter of the pelvic opening is from above downward hence the colt should be born with the back next to the back of the mare. However it is possible for colts to be born with the back next to the base of the pelvic opening. Cutting off limbs or parts of obstructions may be necessary in most obstinate cases. The important things to remember in aiding the mare is to raise the hips high to enable you to straighten the foal if wrong presentation is offered. All aid should be given gently and do not try to cause the birth to quick since it often requires time to straighten a foal or give the pelvic opening time to enlarge.

A mare that encounters difficulty in foaling should be washed out daily for a few days with a gallon of luke warm water having ¼ pint of sheep dip in it. This can be done with a funnel and 4 to 5 feet of rubber tubing. Insert the rubber in the womb and pour the water in the funnel.

DISEASES OF THE BLOOD

DISTEMPER OR

(Strangles), (Shipping Fever)

Distemper is caused by a germ which lives from year to year outside the body of the horse. Hence the necessity of a thorough cleaning up or disinfecting after an attack to prevent succeeding out breaks. The first horses usually get the germs from public watering fountains, feed troughs or infected stables. Highly bred horses from 3 to 5 years old seem to get the disease easier than poorly bred horses or mules or more aged horses. Some people state that a horse never takes distemper but once, however I've seen the same horse effected three times.

This disease is more severe the first time a horse has it than following attacks. From 3 to 5 per cent of the cases die.

SYMPTOMS

The horse in the first stages of the disease has a watery sticky discharge from one or both nostrils. Then the horse coughs, has increased thirst, but prefers to drink often and in small amounts. In two or three days the sticky, watery discharge changes to a dirty white pus. The more severe the case the more pus there is formed.

The first swellings appear in the upper portion of the throat (The Pharynx) or is between the base of the lower jaw bones, (The Sub Maxillary Glands). In addition swelling may appear on any portion of the body, varying in size from a small potato to a hens egg. If not treated, the abscesses usually break the second week of the attack. The horse has a diminished appetite.

TREATMENTS

When horses get strangles place them in open pastures if they have a dry place to lie down and the weather will permit. A pasture having running water in it is preferable, since well horses are not as likely to take the disease from the sick ones. If the weather is snowy or rainy by all means keep them in shelter as the sick horses will easily take cold or may develop pneumonia. Do not feed feverish or irritable foods such as corn, corn fodder or timothy hay. Feed feeds that are not feverish with a laxative effect such as oats, grass, oil meal, or clean clover hay. Allowing the horse to get warm and cool off quick has a tendency to make distemper worse. The swelling may be considerably reduced by applying red iodide of mercury 1 part, lard 4 or 5 parts, The iodide has an antiseptic effect, easily absorbed and causes the blood flow to come to the part. Bathing the abscess in hot water before applying the mercury blister often aids in reducing the pus. In severe cases it will often be necessary to allow the horse to inhale camphor, tar or ammonia fumes. Hold a sponge or bucket below the horses nose containing hot water with one of them in it and let the horse breath the fumes. Some claim better results from lancing the swellings than from applying blisters.

SUFFOCATION

Suffocation in distemper may call for an operation called Tracheotomy. This consists in cutting 2 to 3 inches of the skin parallel with the wind pipe and directly in front of it to avoid arteries. Then a portion of the cartlidge is split parrallel with the first incision and none of the joints of the trachea must be cut for they are hard to heal. Hold the opening open by hooks tied by a string over the neck. This will enable the horse to breathe. Wash the wound daily with a 3 per cent carbolic acid or dip solution. This washing should be done with a half saturated rag so the carbolic acid or dip water that is, "4½ teaspoonful of the drug to 1 pint of the water" does not get in the trachea. If the horse has a tendency to constipate ½ to 1 quart of raw oil may be given or daily dose of 4 to 6 tablespoonfuls of salts. Salts tend to reduce the fever but are more irritating. Give the salts in 1 quart of water.

If the fever becomes severe nothing is better to reduce it than the following formula:

Aconite 1 dram (1 teaspoonful)
Belladonna 2 drams (2 teaspoonsful)
Water 2 ounces (4 tablespoonsful).

Give 3 to 5 teaspoonsful of the above formula every 2 hours or till the fever is reduced or 4 or 5 doses are given. I do not favor aconite alone for it depresses the heart action.

RHEUMATISM

Inflamation of the Muscles and Joints

Rheumatism is probably more frequent in the horse than any of the larger domestic animals. The disease may assume either an acute or a chronic form. In the acute form the pains may shift from joint to joint. It is not always possible to tell whether the disease is one of the muscles or located in the joints. When the joints are effected it is something called articular rheumatism. The muscles of the hips, shoulders and loins are the ones most frequently effected. Animals that have had the disease are more likely to be attacked again. Generalized rheumatism often ends in death. Animals that recover are often stiff.

CAUSES

The exact cause of rheumatism is not well established. One of the more recent theories is that rheumatism is an infectious disease. That is it is caused by disease producing bacteria which enter the body and get into the blood causing the disease to develop. Some believe that rheumatism is caused by accumulation of acid in the blood. Others believe the disease is caused by strains etc.

While the exact and specific causes are unknown there are some known factors that are inducive to the disease upon which most authorities agree. Among these factors are cold, damp quarters, allowing the animals to cool off rapidly after severe exercise. An animal that has been heavily fed and pampered and is suddenly changed to a light diet and exposure is a good subject for the disease. Thus the disease is not infrequently met with in show animals if they are not properly handled. To a limited degree rheumatism seems to be hereditary.

SYMPTOMS

As this disease is both acute and chronic the symptoms may come on very rapidly, or they may be slow in developing. The muscles of the organs of locomation are the ones most frequently effected in the horse. The animal becomes stiff. The joint form of the disease shifts from joint to joint, and the limbs that are first attack often completely recover. The effected joints or muscles are painful to the horse when touched. The stiffness is most noticeable in backing or turning. The horse may limp or even drag the legs. Generalized rheumatism is accompanied by generalized fever while in localized rheumatism local fever is manifest.

TREATMENTS

For localized rheumatism the treatment for swellings and inflamation and is often beneficial and all that is necessary.

The animal should be well bedded and allowed all the water he will drink. The horse should receive laxative feeds as oil meal, oats, bran, clover hay, etc.

In generalized rheumatism ¾ ounce of salicylite of soda may be given 3 times daily in a bran and molasses ball placed well back on the tongue with a long handled spoon.

Friedberger and Frohner recommend Hypodermic injections into

the deep muscles of the shoulder of ¾ to 1½ grains of veratrine for each 1200 pounds live weight. The first dose is to be ¾ grain and to be increased 1-6 of a grain each dose. Make 1 injection daily after 4 to 5 days omit 1 dose and begin again. Never give over 1½ grains per 1200 pounds live weight. Exercise the horse after the injection.

There will probably be uneasiness after the injection unless the horse is exercised. When too much is given the horse sweats profusely, runs saliva, may have spasms and try to vomit. However if directions are followed, such results should not occur.

If such symptoms develop give stimulants as 1 ounce (2 tablespoonsful) of 10 per cent solution of Ammonia in 1½ quarts of water or 4 to 5 pints of coffee. However if mild symptoms develop do not increase the following dose.

ANTHRAX

(*Charbon*), (*Carbuncles*), (*Woolsorters Disease*), *etc.*

General Discussion and Causes

This disease has been known to effect all domestic animals and fowls as well as man. Men working with hides coming from anthrax districts often take the carbuncle form. This is one of the oldest of diseases. Moses probably had reference to this disease in Exodus IX 3-10. Greek writers have made frequent reference to this disease. Outbreaks of anthrax have been officially reported in most of the live stock producing states but it is more frequent in the Northern states and the overflow lands of the lower Mississippi.

Anthrax bacilli prefer low loose soil containing an abundance of decaying vegetable matter. This disease usually occurs during the hot summer months especially if a drouth is being broken by an excess of rain. The heat of the summer is not only favorable to development of anthrax bacilli but the disease germs have been found in the bodies of earth-worms. The rains would naturally bring the worms to the surface. immediately after a drought the pastures are short and more earth containing the bacilli is taken in with the food of the horse, hence it is more frequent after a rain following a dry hot summer.

Outside of the animal body the germs form a tough membrane around themselves and are then known as spores. When this body membrane is formed the germs have more power to resist disinfectants, water,

etc. The spores are capable of living in water from 60 to 70 days. They will live in the soil for 10 years or more and may be carried on a hide from a diseased animal.

SYMPTOMS

The intestinal form of anthrax is more common than the lung or wound form.

The quickness with which the disease develops and terminates is an outstanding symptom. The horse may take suddenly sick and die in less than half an hour or he may live as long as four days in the form where the infection occurs through a wound. Moderate colic pains may be the first symptoms and invariably last throughout the course of the disease terminating in diarrhea. Fever is manifest by portions of the body being cold while fever is present in other parts.

The membranes of the nostrils are blue and tears may come from the eyes. Chill and nervous spasms are not uncommon. However the animals may be dull and walk with a staggering gait. Breathing is fast and often so difficult that death may occur due to suffocation.

In such cases the infection has probably made its invasion through the breathing apparatus and may be accompanied by throat swelling, in which case the animal has difficulty in swallowing. Death usually occurs in from one half to thirty hours.

THE SKIN FORM

This form of anthrax is not as frequent as the intestinal form. The animal may show decided improvement at times and live three or four days.

The skin form is evidenced by considerable swelling in the vicinity where the infection first occurs. Nodular swellings the size of a small hen's egg come on the surface of the body; chiefly on the base of the chest and the inner surface of the fore and hind quarters or on the scrotum or vulva. The swellings at first are hot and painful later they are cool and may become gangrenous.

After death the spleen is enlarged, the liver appears cooked, the blood is black and tarry and refuses to clot. Bloating rapidly takes place after death and the blood may run from the nostrils and anus. The hair is often easily pulled from the hide.

In the lung and intestinal form the mortality is about ninety per cent, while in the skin form the mortallity is about seventy-five per cent.

Prevention and Treatment

Stay absolutely away from all infected pens and animals because the disease can be carried on the shoes or clothing. Keep all effected animals in small open pens away from stock, barns, and pastures and disinfect the pens well, especially before rains with 1 part Potassium Permanganate to 25 parts of water. Keep dogs, neighbors, etc. out. Bury all dead animals where they die in a bed of quick lime, bury at least 6 feet deep. If they are burned haul the wood to the dead animals and don't drag them to the wood for that spreads infection. Be sure all particles burn up completely so no portions can be carried by crows, dogs, cyotes, etc

If the dead animals are skinned, (which should not be done, since man will take the disease). The hide should be soaked in carbolic acid or sheep dip solution for 10 hours. This solution should be in proportion of ½ gallons of drug to 5 gallons of water. Burn all clothes of attendants.

Pasteur's protective innoculation against anthrax is hard to produce in horses. That is it is quite hard to make a healthy horse immune to the disease although it is possible to produce immunity for a few months. A pasture will hold Anthrax infection as long as ten years. It is best to crop such fields. There is a serum on the market to inject into sick animals which is partly successful. One ounce (2 tablespoonsful) of Creolin given every 5 or 6 hours in 2 pints of Raw Oil is probably the most effective drug treatment for the sick horses but it is of little benefit. In such cases the closest deputy state veterinarian should be called into consultation since he is paid by the state for such assistance.

GLANDERS AND FARCY

This is one of the oldest diseases effecting horses, mules, donkeys, rabbits and man. This disease occurs in all quarters of the world. If my advise is heeded, you can not be too careful in dealing with a suspected case of this disease. Man will contract glanders from stock and it is therefore one of the most dangerous diseases known to veterinary medicine.

Never examine a suspected case or go in buildings where there is a suspected case without being properly masked over the nostrils and mouth to prevent the entrance of disease germs into your own system.

These germs are about .09811 inches in length and .04618 inches in

width, hence can be seen only with the highest powered microscope. The hands should be protected with rubber gloves and the mask and gloves burned after examination.

Malet found by his experiments that the disease could not live outside the horses body longer than 4 months. Hence a stable may be disinfected with a 5 per cent or stronger solution of carbolic acid (1 pint to 1 gallon of water) after thoroughly cleaned by masked men and should be safe to reoccupy in 4 months. Sunlight aids in destroying the germs. A barn should be shut up tight and the following used in fumigation, after all stock are out of the building. Place ¼ pint of Potassium Permaganate in several earthen jars, place in all sections of the barn and pour in the one fartherest from the door about ½ pint of Formaldehyde as you approach the door pour ½ pint in the other jars. Leave the barn closed for 6 or 7 hours. If 2 rows of crocks are used, let 2 do the pouring. This should be done before attempting to clean the barn after it is established; the horses have glanders and should be done again before the horses are stabled in such a barn. The germ of glanders and farcy are the same. Formerly they were considered two separate diseases, but it has been definitely establishd that farcy and glanders are the same disease. Glanders effecting the organs of respiration, glands of the head and lungs are of more frequent occurance than the form effecting the skin which is called farcy. However the two forms are often found in the same horse.

Glanders of the nostrils is characterized by lard colored nodules in the nostrils. At the beginning these nodules do not exceed the size of a small pea. These nodules are varying in form from round to oblong and are usually irregular in outline and surrounded by a red ring. As the case advances these ulcers go deeper become larger and very irregular in shape like ice flowers or snow flakes with a peculiar sticky discharge. In addition the glands of the head throw off a discharge, not unlike the discharge of distemper. The horse coughs and a bloody discharge comes from the nostrils. In chronic cases the horse swells on the legs along the neck and shoulders and abdomen. These swellings vary in size from a pin head to the size of a walnut, or these swellings may be isolated or in continuous patches over portions of the entire body. In the acute form the horse may live only a few days but in the chronic form the horse may recover from the swellings and be capable of spreading the disease by unnoticed ulcers in the nose cavity after he is apparently well.

DIAGNOSIS

If a horse is suspected of glanders the Mallen test should be given. This extract is injected beneath the skin. In 1 to 24 hours, usually 6 to 8 hours the fever will rise two or more degrees and the horse will swell at the point of the injection. The fever falls in the course of a few hours and may rise again the following day. If the horse has little or no fever at the beginning of this test it is reliable but is unreliable if fever is present.

TREATMENTS

Most state laws compel the killing of horses effected with glanders. It is the duty of the state veterinarian and his deputies to investigate suspected cases and make arrangements for the compensation of the owners. Due to the danger to both man and beast it is only prudent to destroy such animals.

LOCK JAW

(*Tetanus*)

This disease is caused by a specific disease germ which produces a poison that causes involuntary contraction (spasms) of one or more muscles of the body. When outside the animal body this germ will throw a thickened wall around its body thus enabling it to live many months, but when the proper environment is met it springs from its dormant state and begins rapid multiplication.

Outside the body of the horse the germ is most prevalent in the soil and manure where air is excluded. On some farms the germ seems to develop at every opportunity, while on other farms lock jaw has never been known.

This disease germ is carried into deep wounds usually by foreign matter penetrating deep into the body tissues such as old rusty barb wire recovered from the earth, nails run into the hoofs or flesh, or the germs may be carried into the body by foreign matter remaining on the cord at castration. Wire cuts which leave ragged edges and heal on the outer surface excluding air are favorable to the development of lock jaw. Most people are prone to believe a deep wound is necessary for lock jaw but my observations have led me to conclude it will develop in a

shallow wound that heals on the exterior and excludes the air as quickly as in a deep wound.

Lock Jaw germs sometimes enter the body of the horse in tooth cavities. In conclusion I would say any wound permitting foreign matter, such as nails, barb wire, manure, dirt, etc. and closing by contraction or healing without being thoroughly disinfected makes an ideal place for lock jaw to develop.

Some believe it is possible for the germ to enter the body in a wound along the alimentary canal which seems reasonable to me.

SYMPTOMS

The symptoms of lock jaw develop in from 3 to 30 days after a wound is made. Involuntary contraction (spasms) of the muscles usually begin at the front of the body on the muscles of the head, neck, shoulders, and front legs.

Contraction may begin at the tail and hips and descend to the muscles in the front part of the body. I never knew of a case beginning in the legs and progress toward the head or tail.

The head is held in an elevated position and the neck often assumes an angle similar to that in the does or ewes.

The membrane on the lower part of the eye "The Haw" often covers one half of the eye ball. This symptom does not occur so distinct in any other disease.

Chewing and swallowing are difficult or impossible although the appetite may not be diminished. The jaws are sometimes (not always) set. The muscles of the neck, spine and legs may become set, and the horse may assume a braced position in standing as though the limbs were stilts. Often none of the feet can be raised without the horse falling which may result in death.

The nostrils are enlarged and saliva may come from the mouth.

The horse is restless, and usually carries the tail elevated and to one side. The mortality is high in the acute attacks or attacks that come on quick but recovery sometimes occurs where the contraction of the muscles of the jaws and throat come on slowly. This disease proves fatal in about 60 per cent of the cases.

Prevention and Treatment

On farms where lock jaw is of frequent occurrence, prevention is of utmost importance. All obstacles causng injury such as boards with nails in them improperly stretched wire, or loose wire should be removed or repaired so that stock can not injure themselves. Stables should be thoroughly cleaned and disnfected at frequnet intervals with one of the following reliable disinfectants, by sprinkling.

½ pint of Creolin to 1 gallin of water, 6¼ per cent solution
¼ pint of Formaldehyde to 1 gallon of water, 3 per cent sol. . .
½ pint of Carbolic Acid to 1 gal. of water, 6¼ per cent sol.

All wounds as soon as made should be filled with tincture of iodine or equal parts of liquid lard and turpentine or strong carbolic acid and dusting powders having a drying effect. Never let a wound heal over on the outside and shut puss up in the cavity. Always keep them open a few days.

TREATMENTS

If proper precautions are taken as to wounds as outlined above, it is not supposed the horse will develop lock jaw and the prevention is worth more than all veterinarians can do after the horse develops the disease.

The germ of this disease lives and stays in the wound and does not spread through the blood of the body as most other diseases. However the poisons developed by tetanus bacteria is readily absorbed by the blood and cause the symptoms to develop due to the fact the germs are in the tissue of the wound some surgeons cut all the tissues away on the sides of the wound to its full depth thereby stopping the formation of still more poison since these germs can not live in the presence of air.

To be of any benefit this operation must be done when the very first symptoms appear. The wound should be kept clean with iodine washes for a few days and then daily dusted with drying powders preferably those containing iodine compounds.

The following treatment is recommended for Lock Jaw
25 grains (1-3 teaspoonful) of Carbolic Acid
1 ounce (2 tablespoonsful) of Glycerine
1 ounce (2 tablespoonsful) of water

Mix the above together and inject twice daily under the loose skin of the neck or shoulder. Most horses will drink thin foods such as milk or gruels as outlined on page 20.

In severe pain it may be possible to give by the mouth with a syringe 1 to 1½ ounces of chloral hydrate every 2 hours till the pain is relieved. Now dilute 1 ounce in at least 2 quarts of water to avoid irritation of the throat. If the horse can not swallow 5 grains of sulphate of morphine in 2 teaspoonsful of previously boiled water, may be injected under the skin often enough to relieve pain. (See cut on (page 17, fig. 4,) for the proper kind of a syringe to use to make the injection. (I prefer to use tetanus anti-toxin as a curative agent for lock jaw. As a preventative before symptoms develop 3000 units of tetanus anti-toxin should be injected beneath the skin. As a curative agent 3000 to 6000 units should be injected the first dose depending on the severity of the symptoms. Then every day for 12 to 14 days inject 3000 units. one-tenth of a grain of labelin sulphate injected daily in a separate dose is believed by some to be of benefit when used with the tetanus anti-toxin in a seperate injection. Human anti-toxin will do to inject but stock anti-toxin is much cheaper. It can be gotten from supply houses listed in the back of this book or local drug stores.)

HYDROPHOBIA

(*Rabies, Madness,*)

This is chiefly a disease of the hot summer months. Dogs, foxes and wolves usually inflict the bite to the horse. The saliva contains the germs of this disease hence it is possible for the disease to be carried from a rabied animal to wounds of the well animal by flies.

Provided there are no sores on the mouth or gums it is impossible to give a horse rabies by feeding them food ladened with rabies germs. The symptoms appear from 3 days to 8 weeks after the wound is inflicted The symptoms of the horse are quite variable. Restlesness, pawing, blood shot eyes and stareing, horses gnaw the wound made by rabied animal, and froth at the mouth. Urination is difficult, and sexual excitement increases followed by paralysis of the porterior part of the body.

Not all of these symptoms will be noticeable, but most of them can be observed in most cases. The appetite is ravenous but as the case advances it diminishes until it is below normal. In some cases symptoms are very much modified.

TREATMENTS

Any animal suspected of being bitten by a rabied animal (one having hydrophobia) should have their hair clipped around the wound and vasceline applied all around the surface of the flesh encircling the wound but none applied in the wound. Then the wound should be cleansed to its full depth with dilute nitric acid or by the use of a red hot iron. It is of utmost importance to cleanse to the full depth of all bites. If a piece of caustic potash can be obtained and sharpened to a sharp point and run to the bottom of all wounds it may prevent the disease, however I much prefer the nitric acid or cauterizing treatment. Any animal suspected of being bitten should be isolated for at least 9 weeks so he can not bite other animals and thereby cause a spread of the dsease.

If the animal is a very valuable animal protective innoculation may be advisable. By protective innoculation is meant the securing of the Pasteur institutes in one of the large cities as Chicago, New York, etc., a portion of the weakened virus is placed in the blood every day for 2 or 3 weeks. In man the mortality has been reduced from 75 to 5 per cent. After rabid symptoms appear the treatment is of no value.

Sometimes it is difficult to determine whether the effected animal has or has not rabies.

In that case it is usually a dog. In that case pack the entire head in ice and express it to the State Experiment Station where a thorough examination can be made of the brain by a competent bacteriologist. Prepay such express charges.

COLDS IN THE HEAD

(*Nasal Gleet, Nasal Catarrh, Rhinitis*)

There is two forms of this disease, the acute or quick acting and the chronic or long lasting form. In the acute form the membranes of the nose are feverish and dry. Soon a discharge appears usually from both nostrils, which at first is thin very much like water but as the case advances it becomes more like buttermilk and eventually its make up assumes the form of pus. The discharge is usually smooth but may have lumpy formations in it. In cases where the eyes are effected and the glands of the neck are swollen it indicates a more severe case. This disease is one that seldom works serious results but if longer standing

than three weeks steps should be taken to break it up to prevent it developing into chronic catarrh.

TREATMENTS

It is far better in the treatment of the diseases of the organ of respiration to keep the horse outdoors as long as the horse is dry and has a dry place to lay down. Prevent the horse from cooling off quickly when warm. Hold a bucket of steaming water under the horses nose containing creolin or carbolic acid and allow the horse to inhale the vapors. This should be done several times daily. Vapor salves such as Vick's may be rubbed in the nostrils three times daily.

CHRONIC NASAL CATARRH

Chronic nasal catarrh is the result of allowing the acute form to progress too far usually due to exposure. It requires care not to expose the horse to rain, snow etc. and daily treatment for a few weeks to overcome such a case. Allow the horse to inhale the vapor of hot water containing carbolic acid, creolin, camphor or tar used one after the other each successive time the horse is treated. If only one vapor is used its affect is reduced each succeeding time. The horse should inhale each one of the vapors once a day. In addition every two or three days the nostrils should receive in the form of a douche by a spray or syringe one of the following:

Zinc Sulphate (3 teaspoonsful) 3 drams.
Water, 1 quart, or
Hydrogen Peroxide (3 teaspoonsful) 3 drams
Water, 1 quart.

SORE THROAT, LARYNGITIS, SWELLING OF THE GLOTTIS

This disease is usually found in connection with other disease as inflamation of the pharynx. It is often caused by inflamation of other organs extending to it, or may be caused by irritants, infection or exposure.

SYMPTOMS

The horse coughs a great deal especially if pressure is applied to the organ comparing to Adam's apple in man. Breathing and swallowing are difficult.

TREATMENTS

Allow the horse to breath steam from a bucket containing hot water with 6 or 7 teaspoonsful of turpentine to 1 gallon of water. If the case is severe, continue the treatment for several hours continually renewing the water when it gets too cool to steam. If the case is a mild one 4 or 5 buckets full a day are usually sufficient.

A blister applied on the outside surface externally to the effected parts is of benefit. Such a blister would be: Spanish Fly, 1 part, Lard, 4 parts.

Apply once daily and rub in well or if preferred: Red Iodide of Mercury 1 part, Lard 4 parts.

Hot clothes applied to swellings will give relief. Feed soft feeds as milk. Some horses will drink it others will not. Don't drench. Bran, linseed meal and scalded oats are among the more desirable feeds.

PNEUMONIA

(*Lung Fever*)

I never have known of a horse running in the open fields during the winter months developing pneumonia, provided they have forage to pick and shelter from rain and snow. In my years of experience wintering idle horses, I never have been able to keep horses in as good condition when stall fed, (grain and hay) with a lot to exercise in as when they have some kind of forage to pick at in the open fields, without grain and stabled only during nights of snow and rain. I attribute the results due to the laxative effect of the forage, exercise and plenty of fresh air. Drafts in stables and poor ventilation are two very common causes of pneumonia. The pneumonia germ does not seem to develop well in the presence of pure air. Standing in storms of snow or rain are common causes of pneumonia. Foreign bodies getting into the lungs allowing a warm horse to cool off quickly in cold weather predisposes to pneumonia. Foreign bodies getting into the lungs either from drenching or improper swallowing of food sometimes causes pneumonia and pleurisy.

SYMPTOMS

The membranes of the air passages are continuously exposed to the air and hence they are probably more susceptible or liable to dis-

ease than any other membrane of the body. This is one of the diseases that the inexperienced may be likely to believe there is not much wrong with the horse because he does not go through such symptoms as are manifest in colic. The disease is usually ushered in by a chill. The fever may reach 105 degrees, and last 5 or 6 days and falls quite rapidly.

Muscular weakness is in evidence and the horse usually stands with the front legs spread apart. The appetite is diminished but seldom entirely lost. The membranes of the nostrils are red. The mouth is hot and often sticky. The horse drinks an excessive amount of water. The breathing is rapid and a rusty to yellow discharge comes from the nostrils. Crackling sounds not unlike that of crushed paper in the hand can be heard by placing the ear to the sides of the lung cavity and often by rubbing the sides of the chest with the hand. Death or recovery occurs within 10 days to 3 weeks.

TREATMENTS

The practice of keeping the horse out doors when the weather will permit with sufficient blankets to prevent chilling is gaining a number of followers in late years. This practice has for its foundation the fact that the germs of the disease do not thrive well in the presence of pure air hence when air is taken into the lungs in the pure state it retards the development of the disease. To say the least pure air is by far better in such a case than a poorly ventilated stable or one having drafts.

Constipation generally accompanies fevers, for that reason feed the horse from the beginning of the case laxative feeds such as bran and oil meal mashes, scalded oats (allowed to cool), clover hay that has been properly cured and if the horse will drink it as much as 3 gallons of milk a day. If the horse does not eat foods placed before him in a reasonable time remove them. Do not drench with foods. If the facilities are at hand and the weather will permit, ring hot blankets out of hot water, apply by bandanging to the sides of the chest and over the withers and cover with a dry heavy blanket to hold in the heat. As the wet blankets cool off ring them out and apply hot again. Continue this for two hours and rub dry with alcohol.

Unless conditions are ideal for such a treatment as to drafts and drying without taking more cold it is best to omit it.

Take pure finely ground mustard, mix enough water to make a paste, rub the sides and base of the chest that enclose the sides well with

it and cover with blankets or papers and then blanket, remove in an hour and a half. This may be applied every day or so. Some rubbed on the legs and well bandaged will often aid the circulation in those parts.

Three fourths of 1 teaspoonful (¾ of 1 dram) of quinine given in a spoon or given in a capsule is often very beneficial in the height of the fever. If the fever gets too high the following is good.

Aconite (1 teaspoonful) 1 dram
Belldonna (2 teaspoonsful) 2 drams
Water (4 tablespoonsful) 2 ounces.

Give 3 teaspoonsful of the above every two hours until the fever is reduced or all is given. Or it may be given 1 teaspoonful every ½ hr.

Never give aconite alone for it depresses the heart and the belldonna is to overcome that in pneumonia.

If the horse becomes depressed due to the disease he may be stimulated by the following:

Rectified Spirits 3 ounces (6 tablespoonsful)
Nitrous Ether 1½ ounce (3 tablespoonsful
Water, 1 pint.

Give every 5 hours as a drench with a syringe. In drenching a horse in such a disease be sure he can swallow. Drench slow if too much difficulty is encountered in swallowing it is best to wait a while.

Allowing a horse to inhale vapors from a bucket of hot water with tar or creolin in it for sometime, renewing the hot water as often as it cools so it does not steam. The appetite is a good indication as to how the case is progressing.

CONGESTION OF THE LUNGS

This is caused by over exertion of a horse. The horse may reel, or fall where he is. The exertion reduces the nervous strength until the larynx contracts and sufficient air is not taken into the lungs to purify the blood. The veins of the body stand out prominent and the breathing is rapid.

TREATMENTS

Let about 1 gallon of blood from the juglar vein, not so much if the horse shows improvement. As much as 6 quarts may be let if the horse does not show improvement. The blood is black in congestion due to lack of oxygen.

Give in a drench if the horse can swallow
Sulphuric ether 1½ ounces (3 tablespoonsful)
Turpentine 1½ ounces (3 tablespoonsful)
Milk, 1 quart

Do not repeat the above dose under 10 to 12 hours. Rub the legs until they are warm, dry massage the body and blanket to attempt to draw the blood away from the lungs to the surface of the body.

PARALYSIS

CAUSES

The causes are not definitely known and are probably quite variable.

SYMPTOMS

The loss of the control of the hind quarters inability to rise as they should and difficulty in moving are the chief symptoms in partial paralysis.

TREATMENT

The more severe the symptoms the less likely they are to recover. If the horse can stand in a sling made by 2 poles and old gunny sacks there is hope for recovery. (See illustration). Blister the effected part

(A very satisfactory home made sling.)

which is usually the loin and hips with a blister of 5 parts of lard and 1 part of Spanish fly and give in a drench 1 dram nux vomica twice or three times a day in one pint of water until the muscles twitch or improvement occurs. The twitching of the muscles indicate poisoning. Then omit for 3 or 4 doses and begin by giving 1 dram twice daily.

Feed laxative feeds.

Following is Fowler's Solution which is a good tonic and is believed by some to excell nux vomica in paralysis and broken wind.

Arsenous Acid 1 part

Potassium bicarbonate 2 parts

Water 97 parts

Give the horse 3 to 4 teaspoonsful 2 times daily in the drinking water.

FORAGE POISONING

Wormy Corn Poisoning, Forage Poisoning, Improperly Called Inflammation of the Brain

Mengitis, Mengo Encephalitis

My obversation has led me to believe a very large per cent of the brain troubles of the horse are not due to nervous disorder as much as to poisonous or indigestible foods, however blows and fractures to the spine may cause brain disorder. Invariably in brain disorder the food has been stunted or damaged in growth or curing.

In dry years fodder forage develops prussic acid in some cases which causes brain disorders. In other cases we find an unnormally large amount of indigestible woody matter in the fodder due to dry weather. This causes compaction and brain troubles. In other cases we find molds and deterioration, as is often found in silos and fodders. In recent investigation, ptomaine poisons have been found associated with brain disorders. Ptomaine poisons are the ones sometimes formed in canned fruit and not infrequently kill people. Much wqrk has been done by investigators recently to determine whether corn damaged by worms will or will not poison horses.

In connection with the above fungus growths on forage, wormy corn has also been very thoroughly investigated. Sufficent work has been accomplished to determine that either will poison the horse.

There are sections where wormy corn is fed and does not poison

horses certain years and the following year the same section may sustain a heavy loss probably due to different conditions of rainfall and growth of the plants. Wormy corn can be taken from sections suffering losses into sections of no disease and horses fed the wormy corn or forage will develop the disease, becoming afflicted with staggers, after eating wormy corn or fungi infected forage about 60 days. The sound food coming out of the same crib apparently has no effect upon other horses. It does not seem to be the worms or dust causing the staggers but appears to be a bacteria finding suitable feed for development in the vicinity of the cornworm, or his products. Boiling does not prevent the staggers hence the poison must exist before the corn is fed.

Certain molds form on forage and fodder crops known as fungi generally when a wet spell follows a drouth. This like wormy corn poison is found in certain isolated sections during certain years, or may be only on one man's farm where plant growth has been stunted. Clovers are sometimes held responsible for inflammation of the brain.

Inflamation of the brain is often caused by certain acids deveoping in a given locality or field where plant growth has been stunted by drouth or frost, notable for this is second growth cane and drouth stricken corn stalks.

SYMPTOMS

The symptoms of inflamation of the brain from any of the above causes are inseperable. The symptoms may be those of mental excitement particularly noticeable when the attendant enters the stall.

When the symptoms of mental excitement are outstanding the horse usually does not live long. Where mixed symptoms or symptoms of depression are outstanding the outcome of the case is more favorable.

Symptoms of mental disturbance are loss of appetite refuses to be led and often throws himself when the attendant pulls on the rope or flings himself recklessly against the wall. At intervals the horse may go into a stupor. The organs of swallowing and the tongue may be useless. After 8 to 10 hours the horse has difficulty in standing and may fall to the ground expressing serious uneasiness and arising only with difficulty. The uneasiness while down some what diminishes as the case advances and persistent effort does not result in the horse regaining his feet. The horse presists in turnng only one way and can often be backed into places

they can not be led. The pupils of the horses eyes are dilated, that is they are spread out or enlarged.

In the depressed form of the disease the appetite is not entirely lost, but the horse presists in eating unwholesome food such as bedding dung etc. in preference to pure food. The horse may go into a stupor of a few hours duration at first and from which he can be aroused but the stupor each succeeding time gets longer and more intense. The pupils become enlarged and a staring look is expressed from the eyes. The horse is restless between stupors or even frantic. The gait is staggering and it may be necessary for the horse to run to catch himself from falling. They lean against fences, walls, sides of buildings, etc. The sleepy stupor is not a natural sleep but portions of the eyes are usually exposed. In the acute form often the horse dies in less than 36 hours. While in the depressed form the horse may recover or live several weeks. It is not uncommon to find varying degrees of these symptoms mixed from slight to extreme symptoms. The mortality is about 80 per cent.

TREATMENT

When the disease is prevalent in the community do not feed the grain of forage causing it. If the horse will eat, feed him bran, oil meal or green unstunted fodders.

If the horse is able to swallow, a good physic is usually given first.

In this disease the bowels are hard to move. Give

Barbadoes aloin 6 drams (6 teaspoonsful)

Calomel 1 dram (1 teaspoonful)

Give the above in a capsule or molasses bran ball, repeat in 3 days

From 6 to 8 hours after giving the physic inject with a hollow needle syringe one of the following under the skin of the shoulder in 1 to 2 teaspoonsful of water.

Arecoline 1 (one) grain or Eserine ¾ to 1 grain or

Pilocarpine 2 to 3 grains.

The above drugs gave the best results out in Kansas when forage poisoning was so prevalent. Do not repeat any under 24 hours and then only when the animal is not improved. In fact a few cases taken in time recovered.

Puncture of the spinal cord between the 3rd and 4th vertebra or back of the 5th with a long hollow sterilized trocar has proven beneficial in human medicine and deserves attention in inflamation with horses.

HEAT STROKE

(*Sun Stroke*)

Heat stroke is caused by the horse becoming too warm while at work and is usually called sunstroke by farmers, but horses do not necessarily have to be worked till too warm to have a sunstroke if we were to stay absolutely in the bounds of veterinary medicine.

Heat stroke is far more frequent among farmers and I will deal chiefly with that distress. Heatstroke is an affliction of the brain. In the north half of the United States I have observed that the attacks come during only 3 or 4 of the hottest days of the summer. Usually on such days no breeze blows to carry the body heat away from the horse therefore by extra care on such days practically all cases can be avoided yielding high compensation to the horse owner.

There is nothing as efficient to keep the body temperature of the horse normal on a hot day as plenty of cool water to drink every 2 or 3 hours. Your first thought will be, "How foolish to water a horse every 2 or 3 hours" but when once tried and you see how much cooler the horse keeps and how they appreciate it a barrel will be taken to the fields on hot days. There can be no work done that will enable the horse to stand more work in hot weather. I have tried this and standing in the shade and I know it is far superior to idling much time away in the shade.

Heatstroke is less likely to happen if horses are watered frequently for water reduces the body temperature.

A horse that fails to sweat freely is more subject to heatstroke than one that prespires freely. Sweat is only one way of reducing the body temperature.

SYMPTOMS

Warning is given by horses in all cases before heatstroke occurs. The warning consists of labored breathing, twitching of the muscles, laying back of the ears and lagging.

As the attack approaches the horse may break out in excessive hot or cold sweat, assume a staggering or wabbling gait, drop the head and ears and may fall to the ground. The pupils of the eye get smaller but later enlarge. The mortality is near 60 per cent. Attacks seem to paralize the sweat glands hence a horse once over heat is much more likely to a reoccurence of the trouble.

TREATMENT

Either build a shade over the effected horse or remove them to shade as quickly as possible but do not shut off the air.

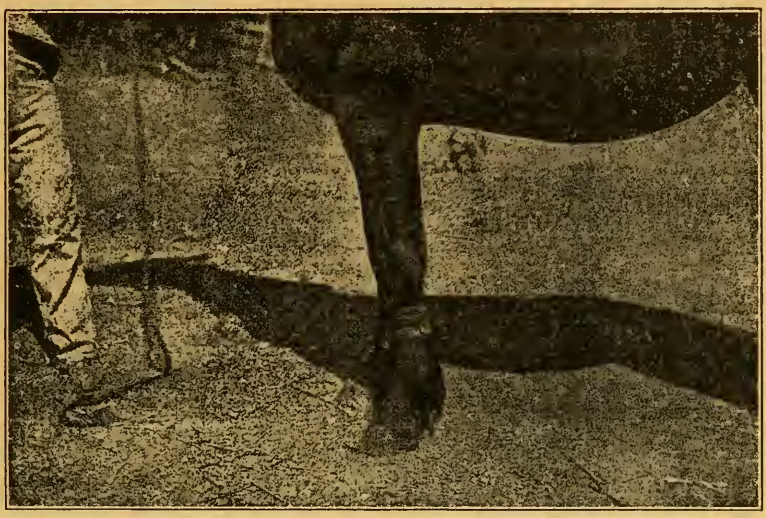
A spray of cold water at first applied very slowly and sparingly should be applied to the head, the top of the neck or along the spine. The more severe the case the more gradual the increase should be before a stream can be run on the head, top of the neck and spine. If the pulse weakens inject every 20 minutes ¼ dram (¼ teaspoonful) of camphor under the skin of the neck with a hollow needle syringe.

Allow the horse to inhale small amounts of camphor. Bathe the head between and back of ears with it. Feed the horse flour gruels, bran and light feeds for a few days.

SNAKE BITES

Stock are quite frequently bitten by snakes while grazing in open pastures. The bites are more frequent on the legs, lips and throat since they are the parts closest to the ground. Such a wound may cause puss to form or the poison of the bite may be absorbed by the animal and cause its death. A snake bite is soft to the touch giving away when the pressure of the hand is applied. Such a swelling is not well defined. Upon close examination the prints of the fangs of the snake may be seen. Horses and cattle so effected may show no other symptoms, but when the poison is having a serious effect on the body, the animal becomes dull and weak. The breathing is difficult and the mucous membrane often becomes blue.

The seriousness of the case depends on the kind and size of the snake inflecting the wound. The larger the snake the more poison they will inject. If the attendant is present at the time the animal is bitten, the best plan is to take a clean knife and cut out the portion of the flesh affected before the poison is absorbed by the blood. Such a wound made by the removal of flesh should be washed with potassium permangnate iodine or other disinfectant and bandaged with cotton. The removal of a portion of the flesh is not always practical, in that case a rubber ligature should be tightly stretched around the leg. If stretched too



A good method to check circulation in bleeding or snake bites.

tight the leg will get cold and if too loose the poison of the bite will have unretarded circulation into the system and the ligature will do no good. This ligature should always be placed around the limb between the bite and the heart. The object of retarding the circulation is to prevent the animal from getting too large a dose of snake poison in a given period. There is an antivenomous serum on the market for human beings 10 c. c. is a dose for an adult. This serum used in doses in proportion to the body weight has given good service in veterinary practice. That is to say if 10 c. c. was a dose for a 150 pound man, 60 to 70 cubic centimeters would be a dose for a 1000 pound animal. This product is kept by many druggists. Chlorinated lime 15 grains, (¼ teaspoonful) dissolved in 2 ounces, (4 tablespoonsful) of water and all of it injected in the tissue under the skin with a hollow needle syringe will neutralize the poison of the snake. These injections should be made in several places surrounding the bite. The sooner action is taken with snake bites the more certain you are of results.

EXAMINATION OF THE HORSES EYES

Eyes are almost as essential to the make up of a good horse as a pair of legs and yet scores of people are deceived every year in the eyes of horses. To test a horses eyes do not throw the hand towards the horse's eye as if you were going to slap them in the eye with the palm of the hand. Such a process causes a breeze and a horse entirely blind is usually sensitive to such warnings and might respond by blinking the eye. The propor way is to turn the palm of the hand toward the earth and with the thumb and index finger drawn gently towards the eye no breeze does not fan the horse and one can determine whether or not the horse is able to see.

However the above is not an infallible test of the eye. The horse may be able to see the movement of the hand and still have very defective eye sight. Cloudiness may be sufficient that an observer can detect it in bright sunlight, however I have know of horses that were completely blind, being sold to long experienced horse buyers when the eyes were examined in bright sunlight. To make a thorough examination take the horse to a stable where the sunlight is shut off from above and the sides. Then by having a door open in front of the horse (preferably one that does not admit sunlight) the observer is able to detect blue cloudiness if there is any. If the stable is too dark an artifical light may be used. All portions of a horses eye should be clear, free from cloudiness and not indefinite or blue in outline.

THE HAW OF THE EYE (Membrane Nictitaus)

This membrane is not always noticed by an observer and when first noticed by some people they believe an abnormal growth is coming over the eye. One may be prone to take the advice of an uninformed person and resort to the cruel measures of pulling it out or otherwise disposing of it. This membrane can be seen on any normal horse with good eyes by pressing in on both the upper and lower eyelids and at the same time hold them apart.

Anything causing the eyeball to sink into the head will cause the membrane to become more distinct. It is situated when at rest in the corner of the eye closest to the horses nose. When in use it is to remove foreign particles from the eye it sweeps back from this corner over the eyeball. In lock jaw, (tetanus) the cartlidge covers a large portion of the eye continuously, probably due to the sinking of the eyeballs into the head.

INFLAMMATION OF THE EYELIDS

Inflamation is caused by irritating the eye. It is sometimes due to foreign particles in the eyes as chaff, thorns, particles of steel, etc. Sometimes it is due to a bruise sustained while struggling in sickness.

Inflammation may be due to a blow from a whip, too tight a collar interfering with the circulation of the blood may cause inflammation of the eye-lid. The use of low, damp pastures or the approach of another disease as opthalmia may cause it.

SYMPTOMS

Swelling of the lids may be sufficient to cover the entire eye-ball. Tears run down the cheek leaving a waxy dirty path. The eye forms more or less gray dirty matter. When the eye-lid is rolled over a pencil inflammation of the lid and white portion of the eye are to be seen and little nodules about the size of a pin head may be present on the inner surface of the lid.

TREATMENT

Since this trouble is usually caused by irritants first examine the eye for foreign particles and if any are present remove them. The inflamation can be reduced by keeping the eye packed in cold packs frequently renewed to keep moist, in the following solution.

Sugar of Lead (1 level teaspoonful) 1 dram
Gum camphor (1 level teaspoonful) 1 dram
1 quart of previously boiled clean rain water.

In connection with the above 3 or 4 times daily drop a few drops of the following in the eye. Place in a tea cup 3 rounding teaspoonsful of boric acid, moisten and work to a stiff dough. Add enough water to make one pint of the solution. If sugar of lead and camphor is not available a boric acid pack may be used.

Following is a good eye wash to cool, heal, soothe and reduce inflamation in most any kind of eye trouble. Apply two or three times daily with a glass medicine dropper.

Glycerine, 12 drams
Paregoric, 2 drams
Lead Acetate, 20 grains.

Allowing a horse to eat feed out of a low manger or off of the ground induces excess blood to the head and hinders progress in reduc-

ing the swelling. When nodules are present on the lid they should be painted with a two per cent silver nitrate solution twice a day. This can be applied with a small feather and glass rod. Pulling the eye-lashes when examining the eye-lids is inducive to inflamation and should be avoided.

MOON BLINDNESS

(*Opthalmia*)

The cause of this disease has not been established. Some believe it to be caused by irritations of the eye as a blow from a whip or by foreign matter in the eye. Some believe it hereditary. I do not believe this is a hereditary disease, I believe it is the result of the transmission from the parent to the off-spring, a pair of weak eyes, which make the off-spring more susceptible or more capable of developing opthalmia. I have seen horses with opthalmia when all their ancestors for a number of generations were free from the disease. In a large number of cases of opthalmia the horses have been over-worked or worked when in poor condition, or been forced to exposure, or to irritant or poisonous substances, among such substances I would mention, weed pollen, excessive pulling, dust, blows with whips or foreign particles in the eye. Compelling a horse to stand daily with direct sunlight shining in the eye predisposes to eye troubles.

SYMPTOMS

The eye-lids are swollen and the horse often keeps the eyes partially or entirely closed in an effort to break the rays of light. This disease almost without exception effects only one eye at a time, but before many weeks the other eye becomes effected.

Some cases gradually get worse and periodic recovery never follows, other cases apparently get well for a period only to receive a second attack leaving much worse results than the first. Some cases develop a distinct cloudiness in the beginning but in some cases cloudiness is hard to detect in the open sunlight until subsequent attacks. Some horses are able to see where they are going for years, while some lose the sight in a few weeks. The eyes eventually become a watery, milky white.

TREATMENT

This disease is incurable. When it is treated a mild physic is given, darkened stalls and a cooling and soothing solution such as 3

teaspoonfuls of boric acid moistened and worked to a stiff dough and sufficient water added to make one pint of solution. A portion is applied about 3 times daily, by use of a glass medicine dropper.

WATERING OF THE EYE OR OBSTRUCTION OF LACHRYMAL OPENING

Tears of the eye serve a double purpose, first they keep the membrane of the eye moist, second they serve to aid in the removal of foreign matter from the eye.

The tears are formed by glands situated above the eye flow down over the eye and escape through an opening situated in the innermost corner of the eye. This opening empties into the nostril cavity by means of a small duct or canal which sometimes becomes clogged with muco purlent matter.

TREATMENT

Feeding of warm bran mashes or similar feeds from which steam is escaping out of a nose bag is often all that is necessary to open the passage way. Eye washes as previously described may aid in the treatment of such a case. Mentholatum rubbed up in the nostrils aids in many cases. However it may be necessary to open up the canal by means of a silver probe in the most obstinate cases.

BIG HEAD, HONEY COMBING OF THE BONES

(*Osteomalacia*)

CAUSES

This is a disease that is found chiefly in the Atlantic and Southern States. It is caused by a deficiency of chiefly lime and phosphorous in the make up of the bones.

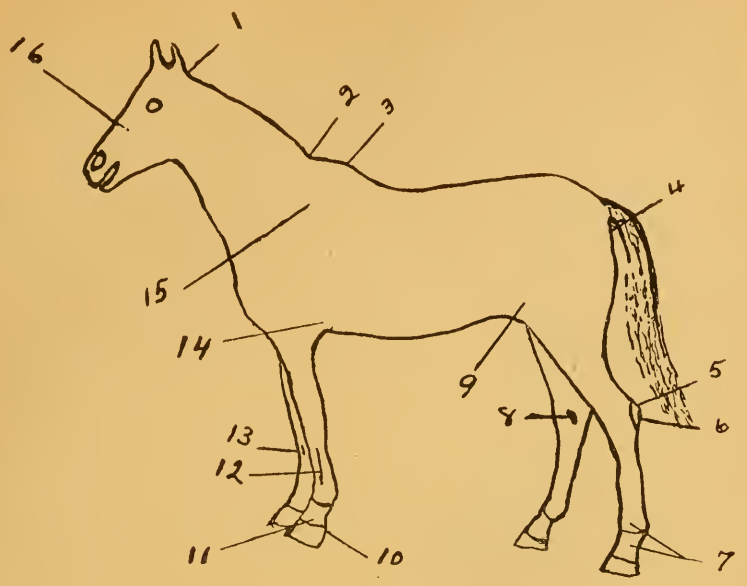
SYMPTOMS

At first the horse shows lameness which may be mistaken for muscular rheumatism or muscular lameness. Lameness of the back is evidenced. These symptoms may not be noticed and the enlargement of the bones of the head and chest may be the first symptoms noticed. Upon

examination it will be discovered the bones give when pressure is applied with the fingers. The disease effects all bones of the body and particullarly those of the head, chest, ribs, vertebra and legs. If a horse rares or falls it often results in tearing a muscle loose from its attachment to the bone or may break the bones of the legs, head or ribs. Gallie 17

TREATMENT

Treatment consists chiefly in feeding the horse foods rich in those elements (lime and phosphorous) which the bones lack. Such feeds as leguminous hay, pea hay, bean hay and clovers. Other feeds rich in lime and phosphorous are bran, oats, and linseed meal. There is nothing any better than cotton seed meal, if fed sparingly and not longer than 60 days. Do not feed too much or the horse will go off of feed for a few feeds. A change in drinking to well water is much desired since the lime content is usually higher in well water. Feed a tablespoonful of macerated bone meal in the feed three times daily. If it is impossible to obtain macerated meal feed a tablespoonful of calcium phosphate in each feed.



Location of Various Diseases of the Horse

1 Poll Evil.
2 Sit Fast.
3 Fistula.
4 Prolapse of Rectum.
5 Capped Hock.
6 Thoroughpin.
7 High and Low Ring Bone.
8 Spavin.
9 Stifle.
10 Side Bones.
11 Quittor.
12 Splint.
13 Wind Puff.
14 Shoe Boil.
15 Swenney.
16 Facial Stone Calculi.

A BLEMISH AND UNSOUNDNESS

A blemish on a horse is something that mars the beauty but does not detract from the usefulness of the individual. Such injuries as wire cuts are in this class. An unsoundness detracts from the usefulness of the horse, among these we have defective sight, spavins, etc.

BONE SPAVIN, RING BONE AND SPLINTS

Bone Spavin may come either on the inside or outside of the hock joint.

Ring Bone may come on the pastern bone, above or below it.

Splint comes either on the inner or outer surface of the cannon bone.

These three diseases can well be considered under one head for the following reasons.

I All are bony enlargements.

II All make the horse go lame.

III Thehorse may be made to go sound on any of them.

IV All are caused by a bruise or inherited weakness.

V All receive the same medical treatment.

These diseases are not directly transmitted from parent to off-spring. However, parents lacking size or quality, or proper shape of bone will transmit that characteristic favorable to the development of such diseases Excessive strains while pulling under slippery footing or over loading usually is the direct cause of these diseases. However, ring bone may be caused by a sprain or develop on a horse that has previously received a barb wire cut in the pastern joint.

TREATMENT

Give the horse 4 to 6 weeks rest in an open pasture. As soon as the disease is noticed, treatment should begin to prevent further bony enlargement and to enable the horse to go sound. We can not hope to elimenate all of the bony enlargement but we can keep the horse from going lame. The sooner treatment is given the smaller will be the permanent bony enlargement. In mild to moderate cases any of the following should accomplish the desired results. Apply to the swelling:

Red Iodide of Mercury 1 part
Lard 6 parts

Or

Spanish Fly 1 part
Lard 6 parts.

Apply either of the above every second or third day until 3 applications are given or the enlargement is well blistered. The more you rub them the better they will blister. Hot water applied before a blister and rubbed in intensifies any blister.

If either of the above fail to make the horse go sound two weeks after treated you probably have failed to stop bony enlargement and a portion of the following lineament should be rubbed on the enlargement.

Never give internally.

Oil of Sassafras, 2 ounces

Turpentine, 4 ounces.

Raw Oil, 4 ounces

Croton Oil, ½ ounce

Moisten the bony enlargement with a portion of the lineament and rub in. Do this twice during 24 hours, and repeat in 8 days if the horse still goes lame. Some people object to this lineament because it often removes some of the hair, but otherwise it will not harm a horse in any way. The removal of hair is far preferable to a spavin or ring bone.

I have met with such good results in curing the lameness caused by such diseases, that I very seldom use anything else. In the case of a spavin where the lineament will run down on the leg, clip the hair and apply vaseline. If the hair is not clipped it will hold the vaseline away from the skin and the lineament will remove a streak of hair unnecessarily.

SIDE BONES

There is a cartilage situated immediately above the hind quarters of the front hoof, on the inside of each quarter. When these cartilages are hard and firm and immovable with the thumb and forefinger, they are known as side bones.

Horses possessing straight pastern bones and straight shoulders which goes to make excess concussion in traveling are quite subject to this disease. However heavy horses with shoulders of the proper slope may develop the disease if hammered over frozen roads or hard pavements. It causes the horse to go lame particularly noticeable after they cool off or are led out of the stable in the mornings.

They take short steps and travel in their feet much the same as in founder.

TREATMENT

Apply cold water cloths alternated with clothes rung out of hot water for 45 minutes to 1½ hours and apply the following every other day for two times. Rub in well.

Spanish Fly, 1 part
Lard, 7 parts

The lineament prescribed for ring bone may be used for side bones with satisfactory results.

SWENY

(*Wasting Away of the Muscles*)

This disease is more frequently found in the muscles of the scapula, however it may occur in the thick muscles of the hips.

Sweny is usually caused by over-loading, the horse wearing a collar that is too large, however it may result from the diseases of the feet causing the horse to walk unaturally.

TREATMENT

The horse should have a mild blister as
Spanish Fly, 1 part
Lard, 5 parts
twice a week. The muscles effected should be rubbed by the hands twice daily. The horse should not be worked. It usually takes from three to seven weeks for recovery to take place and the muscles to fill in. The muscles will not fill in under continuous work.

NAIL PUNCTURE

The symptoms are not different to those of bruised or tender frog. However, the treatment should be thorough.

The nail wound is not uncommon on farms where pieces of boards etc. are not cleaned up and is by no means a matter to be in any way neglected. After removing the nail or other foreign particle the wound often closes up making it impossible to get germ killing drugs (antiseptics) to penetrate to the base of the wound. When ever a nail wound is left without the drugs penetrating to the full depth the owner takes a chance of lock jaw or inflammation.

TREATMENT

Before attempting to do anything with the horse get the necessities ready. The necessities will consist of a solution of bichlorid of mercury water 1 to 500 or pure dip, pure turpentine, pure lysol or carbolic acid. In addition the following should be placed in a pan and boiled 15 minutes, 1 sharp knife, a hypodermic syringe and blunt pointed needle. The blunt pointed hollow slender needle can be made by taking a hypodermic syringe needle and filing off the point, (see cut page 17, fig. 4.) Such needles and syringes are often used for putting vaccines, serums, and other drugs under the skin and should be kept on hand.

Every thing ready take some warm water and soap and clean the dirt out of the horses foot before using the pincers to pull the nail.

This is done to prevent dirt from falling into the hole made by the nail.

After the nail is out with the syrnge and blunt pointed small needle force some good germ killing drug as tincture of iodine, bichloride of mercury, lysol, turpentine, etc. in the cavity being sure the drug reaches the bottom of the cavity. Do this 3 or 4 times. The operation should be repeated for several days. Allowing a deep wound to close up when pus is forming inside causes pretty serious trouble and such should always be prevented. When such a case develops it is usually necessary to open the wound to the bottom and keep it washed out well with germ killing drugs.

LAMENESS

Lameness Due to Shedding or Bruising the Frog of the Foot

At intervals a portion of the frog of the horses foot is replaced by new tissue. The new tissue is often quite tender or gets bruised and the closest observer can not tell whether the lameness is due to a nail or tender frog tissue until a thorough examination is made. When the frog is effected they walk on the toe, have very little fever. The frog is sensitive to pressure and the shedding of old frog tissue can usually be seen.

TREATMENT

The foot should be thoroughly cleaned by the use of soap and warm

water. If ragged edges of the old frog are seen they should be trimmed away to make sure there is no nail or other foreign particles present. Turpentine should be applied a few times to reduce the soreness.

SPRAIN BRUISES AND INFLAMMATION

Sprains, bruises, etc. which are not in the location of established disease as ring bone, quittors, fistulæ etc. Sometimes occurs in the horse an example is rheumatism.

When such inflammation occurs, the affceted part should be massaged by hand rubbing several times daily.

Hot baths should be given such swellings twice daily by ringing hot cloths out of boiling water and apply as hot as the horse will stand them. Then apply a mild linement or mild blister as 1 part of Spanish fly to 6 parts of lard. Bandage the inflammation not too tight in cotton. The bandaging of sprains, bruises, etc. in cotton has long been practiced among doctors and the public has believed it theory or to mystify, but such is not the case, it is based on good sound sense. The object in inflammation is to induce the blood to circulate in the effected part. Linement and bandaging in cotton, etc., all induce heat to the effected part. Then the blood comes in an effort to equalize body temperature. The large amount of blood flowing through the effected part also purifies the part having inflammation in it and thereby reduces swelling.

Bathing, rubbing, or the application of lineaments have the same effect. Rubbing makes most linements more effective.

CAPPED HOCK, CAPPED KNEE, CAPPED ELBOW

These three diseases can well be considered under on head since they are all usually caused by a bruise, all result in swelling of the effected joint which at first is blood and matter but may develop into pus.

Capped hock is often caused by a presistant kicker hitting the hock against the side of the stall. Capped knee is often caused by a horse slipping and falling on the knee. Capped elbow or shoe boil is caused by the shoe irritating the elbow joint. The swelling may come on the effected joint suddenly or be several days in developing.

It is important to remove the cause. If the horse persists in kicking

try to remove the cause of irritation. If this can not be done it is well to pad the sides of the stall.

If the horse has capped elbow and is shod and if it is possible to remove the shoes it is prudent to do so. Treatment should not be delayed. A lump of blood and water is much easier to scatter than one of pus or fibrous tissue.

My experience has led me to believe it is not wise to puncture such places over a joint, for a joint is easily infected. Due to the flexing of a joint such a wound is hard to heal. Most cases can be scattered when in the form of blood and water by the following:

Spanish Fly, 1 part
Lard, 5 parts.

Apply every other day until scabs appear or the swelling is scattered. Rub in well.

For more advanced cases the following is better

Norway Tar, 4.5 parts
Tannic Acid, 1 part.

Apply the mixture to the swelling daily until removal of the hair.

FIRING

Firing is an old practice but with age it is one of the remedies that has not lost any of its efficiency. The practice is superior to the blister alone in such cases as ring bone, old sprains, side bones. all kinds of old spavins anb such diseases. The operation is not as cruel as some people are prone to believe, remember in firing that severity beyond limited degree does not increase the efficiency of the operation.

The only object is to cause irritation to induce the blood to circulate in the diseased part. The firing points are heat to a white heat in alcohol flame and 15 to 20 punctures are made in the skin. Before performing the operation, clip the hair close. Apply a blister after firing as follows:

Red Iodide of Mercury, 1 part
Lard, 5 parts.

BLOOD SPAVIN

Blood spavin is a swelling on the inside of the hock, and gives way under pressure. The swelling occurs a little above the point of hog

spavin. The swelling is filled with joint oil. If the case is taken in its earlier stage apply

Spanish Fly, 1 part
Lard, 5 parts.
Rub in well.

If the case is advanced firing may be necessary before the blister.

BOG SPAVIN

Bog spavin is a swelling containing joint oil and gives way under pressure. It is situated below the blood spavin on the upper forward and inner part of the hock joint. The treatment is the same as in blood spavin.

THOROUGH-PIN

This occurs between the great tendon of the hock joint and above the hock proper. The Thorough Pin comes in the same place a beef is hung on the gamblin. The treatment is the same as in the Spavin.

SHOULDER ABSCESSES

Shoulder abscesses may be caused by a horse pulling side ways or by an ill fitting collar.

When authentic information is desired on any particular subject, we can do no better than to observe how some big concern solves the same problem. We can do no better than to take into consideration how concerns like circuses and packers, etc. that work large number of horses fit the collars and hames.

They use no pads, but heavy draft, close fitting collars. I am of the opinion the farmers collars should fit even closer for his field work is of a lower draft since the single trees are hitched to tools closer to the ground than on wagons and a closer fitting collar helps to raise the draft off of the point of the shoulder. I have had better results by working the hame draft higher so as to take the load off of the point of the shoulder. I have had far better results by fitting the collar up as tight as it can be worn without choking the horse in the spring, then by the time the horse shrinks after a few days work it will be loose enough that the top of the neck will not get sore. There is not much danger

of sore necks in the early spring work for there is usually not much weight on the neck.

TREATMENT

Shoulder abscesses are enlargements on the shoulder that contain at first blood and water but later pus forms and is surrounded by hard fibrous tissue. Often a tighter fitting collar can be used, the draft of the hames raised and work continued with the horse until the rush work of the season is over. Improvement will be hastened by painting such abscesses twice daily with a mixture of

2 ounces (4 tablespoonsful) of tincture of iodine
6 ounces (12 tablespoonsful) of extract of witch-hazel

In cases that are more advanced and disappear when the horse is at rest only to appear when the horse returns to work, probably the best method is to remove the fibrous tissue with the knife or by the use of a caustic. I prefer the latter since it does more perfect work and heals much faster, according to my observation and experience.

Copper sulphate (blue stone) is the most common caustic used to eat out fibrous tissue. A lance should be inserted into the lump from above until the cavity is reached and the pocket filled with all the blue stone it will hold. In 48 hours refill the cavity with blue stone. In from 5 to 10 days the fibrous tissue will be loose and must be removed. After it is removed open the cavity at the lowest point and place in it a rubber tube and leave it there as long as pus runs out. If a rubber tube is not inserted it will heal up on the outside and pus will have no outlet and the work will not be successful.

(The horses foot is held up by a strong harness breast strap, a safe method to use in treating wire cuts, etc.)

GALDED OR CHAFFED SHOULDERS

Be sure the collar fits snug, is clean, smooth and dry. Men use their collars too large to prevent chaffing. Bathe the shoulders at noon and night with soft water to which has been added one rounding teaspoonful of salt to the pint.

The colts shoulders should be toughened before work starts by adding ½ ounce (3 level teaspoonsful) of tannic acid to 1 gallon of water and bathing them twice daily.

When shoulders become chaffed I prefer to use a drying powder having carbolic acid, iodine or iodoform in them. Such dusting powders are for sale by most drug stores. Fresh air slacked lime is very good since it has a drying and antiseptic effect.

If an ointment is preferred a very good one can be made by mixing together.

1 dram (1 level teaspoonful) of iodoform
1 dram (3 teaspoonfuls) of tannic acid
1 dram (2 teaspoonfuls) of boric acid
1 ounce (2 rounding tablespoonfuls) of vaseline

SIT-FAST

This is a dead horn like slough ordinarily found connected up with the deep muscles of the neck under the top of the collar, causing the horse a great deal of irritation They are caused by the mane being under the collar, too heavy a load on the neck with a tight collar or foreign substance such as cockle burrs working under the top of the collar. Often they are indefinite in outline and a flaxseed poultice will make the outline distinct.

Place in a mason fruit jar some finely powdered blue stone. Pour warm water over it and stir every few hours. Pour a small amount of this around the sit-fast and in a very few days it can be pulled loose from its attachment to the deep muscles and dusting powders applied to induce healing.

BARB WIRE CUTS

Barb wire cuts are usually caused by improperly stretched wire. A wound of the flesh never should be allowed to heal over on the outer surface before it has healed inside. If it heals on the outside before it heals inside, pus may be shut up in the wound without drainage and gangrene or blood poison be the result. If bleeding is severe, the blood may be induced to stop by finding the cut artery and tieing it with a cord or clamping it with the artery forceps, (see page 17, fig. 9.)

A strap twisted with a stick or a rubber ligature (See cut of instruments on (page 17, fig. 5) between the wound and the heart will often stop bleeding. Packing the wound full of cotton will often stop bleeding. A healthy horse can lose as much as 6 quarts of blood without serious disadvantage.

After bleeding has stopped, remove any foreign matter in the wound and wash it with a good dip, iodine, or carbolic acid water solution. Clip the ragged edges with a clean pair of shears and draw the edges of the wound together and sew with cobbler's thread doubled a number of times and well waxed with bees-wax or rosin or prepared cat-gut thread may be bought at drug stores. In sewing up such a wound at the lowest point, leave an opening for the escape of pus. If the wound swells much you probably have not sufficient drainage and it may be necessary to clip a stitch and run the finger back into the wound and wash it again with iodine. I usually fill such a wound before sewing with a good antiseptic dusting powder which can be secured at drug

stores cheaper than it can be made. If the stitches tear out, make a new one close by. An efficient dusting powder may be made as follows. Gallie 20

Lime Sulphate, 3 parts
Lead Acetate, 3 parts
Carbolic Acid, 3 parts
Starch, 90 parts.

A good healing solution is as follows:

Balsm Firrh, 2 ounces (4 tablespoonsful)
Alcohol, 8 ounces (16 tablespoonsful)
Tincture assafoetida, 2 ounces (4 tablespoonfuls)

Apply 2 times daily.

White lotion is often used for open flesh wounds. It is made by combining

Lead Acctate, 1 ounce (2 tablespoonsful)
Zinc Sulphate, 6 drams (6 teaspoonsful)
Water, 1 pint

Apply 2 times daily.

For a fresh open wound nothing is better than to paint it with tincture of iodine.

If a wound as barb wire cut stops healing and proud flesh begins to develop, paint it with silver nitrate solution daily until the growth of proud flesh is checked. See "Proud Flesh."

FLY BLOW

"Maggots"

The blow fly is a great enemy of open wounds during warm summer months. The eggs are laid in the wound by the blow fly and develop a maggot or larvae in a few days which lives on the tissue of the animal. If attention is not given such cases they may eat to the vital organ as the brain or intestines and death follow.

TREATMENT

In most wounds the maggot can be removed by the hand or with a wooden splinter, however, where there is any doubt about the thoroughness of the job, pure gasoline can be poured in the cavity without injury to the wound. Maggots will die in a very few seconds if kept in gaso-

line. A good formulae for keeping the fly from depositing the egg is

Pine tar, ¼ pint

Creolin, 4 drams, (4 teaspoonsful.)

The creolin and pine tar should be swabbed on the wound every 24 to 48 hours to keep the fly from depositing her eggs.

BURNS

In case fire burns are inflicted to live stock, mix together equal parts of

Raw linseed oil

Bees wax

Boil these two until they thoroughly mix after which add one half the volume of cream. Apply to the burns and bandage with heavy woolen cloths. In case these elements can not be obtained flour or pulverized starch may be used but the former is much better since it induces healing and will not leave a scar. The main object in burns is to keep the air away and do not remove the skin of any blisters that may form.

PROUD FLESH

Proud flesh is caused by the improper healing of a wound as a barb wire cut. If an old case it is often necessary to peel the abnormal tissue off with a knife and apply silver nitrate or luna caustic. Luna caustic is silver nitrate run into sticks. Burn it back until sufficiently reduced. Copper sulphate may be applied to reduce proud flesh. After the abnormal tissue is reduced then healing can be induced by applying dusting powders or the following 2 times daily.

Lead Acetate, 1 ounce (2 tablespoonsful)

Zinc Sulphate, 6 drams (6 teaspoonsful)

Water, 1 pint.

The above is known as white lotion and sells for about .75 cents a pint at drug stores.

FISTULA, POLL-EVIL AND QUITTORS

The word fistula is derived from the latin meaning a pipe like organ, hence the name may be applied properly to any soft swelling on the external surface of the body which is connected by pipes or tubes to some internal body cavity. Since a high per cent of the cases come on work

horses rather than unbroke fillies and geldings, I have formed the conclusion that a very large per cent of the cases are preventable by good horsemanship. Heavy halters and the hitting of the poll by pulling back on the halter undoubtly cause a large per cent of the cases of poll-evil.

My observation has led me to believe that no small per cent of the fistula of the withers is caused by continually morning after morning throwing the harness hames on the withers of the horse instead of holding to the harness and quietly placing them on the horse. It is very common to see men let the tongue hit the horses foot when releasing the neck yoke. Nothing could be better to cause a quittor on the foot.

The above ways are not the only ways these diseases are likely to be formed but in my opinion they are among the more common causes. Anything that bruises the poll, withers or foot may cause fistula of that portion of the body.

Horses with unusually high or thick withers are much more subject to fistula than horses with low or thin withers. Purchases and breeding should be made to prevent the thick and high withered horse. fistula, poll-evil and such diseases.

TREATMENT

In most communities there are men who claim to cure horses with Fistula, Poll-Evil and such diseases. A horse that is just taking it often looks cheap to such veterinarians when priced at half price and where such sales are made there are very few regrets on the part of the seller for often it takes a period of months to cure or the horse is left with bad wethers after treatment.

If cases are taken when they first appear they can often be scattered with the following formulae. Clip all hair off of the swelling and below it where the lineament is likely to run. After clipping rub a good thick smear of vaseline over where you do not want the lineament to run down and effect the hair.

Bathe the swelling with alternate hot and cold clothes for 30 minutes. Apply a portion of the following and rub it some.

Oil of sassafras, 2 ounces
Turpentine, 4 ounces
Raw oil, 4 ounces
Croton oil, ½ ounce.

Apply from 2 to 5 times 12 hours apart. Omit then till the swelling begins to come back, if more swelling appears, rub vaseline over the part to protect and app y the liniment as often as the swelling starts to reappear. This treatment, if taken at the start of the case cures from 30 to 40 per cent of the cases.

If the above liniment fails the horse will probably have the poll-evil, fistula, or quittor from 8 months to 3 years. Many cases eventually get well of their own accord. Sometimes an operation where by all the fibrous tissue is removed is successful in old cases.

There is a poly bacterin on the market for fistula cases for sale by drug houses, (see last pages of this book). If treatment is undertaken a purchase is sometimes beneficial. It is injected under the skin. Such products can sometimes be purchased through the local druggist.

In fistula cases of poll-evil, quittors and fistula of withers one treatment is to search out all the tubes with a probe after they break, and fill them with as much blue stone as they wi l hold.

Then clip all the hair where the drug will run down on it and put on a good coat of vaseline to prevent the hair from being removed. In 5 to 10 days remove the fibrous tissue from the cavity and make the opening outward at the lowest part of the cavity and keep it open so the pus will have opportunity to drain out.

Cleanse the cavity the first 3 or 4 days with a weak solution of carbolic acid water and wash daily with white lotion (only) after 10 days made as follows.

Lead Acetate, 1 ounce
Zinc Sulphate, 6 drams
Water, 1 pint.

The drainage opening must be kept from healing by placing a small tube or coarse string in it and working it every 2 or 3 days. Tie the horses head to keep him from gnawing the wound after the drug is placed in, wash it with white lotion from the time the tubes are removed.

Beck's Ointment has given satisfactory results in advanced cases of fistula.

The formulae is melted and allowed to cool so it can be used in a syringe, and the cavities refilled with it twice a week. It consists of:

Bismuth sub-nitrate, 6 drams
White Wax, 1 dram
Vaseline, 1½ ounces
Soft Paraffin, 1 dram.

Boil and mix and keep in a clean Mason fruit jar.

I am of the opinion that most fistula cases are very deep seated before they make any outward swelling. At least cases cut open where first noticed often have fibrous tissue comparetively deep seated for this reason it is quite hard to reduce them with a lineament and if such cases can be sold for half value to some one that can cure them it is a lot of daily work saved for 6 months or more.

SCRATCHES-GREASE

These are two separate diseases but differ greatly in location. The causes, effect and treatment in a large measure is the same.

CAUSES

Ovefeeding on grain, unwholesome foods, close hot dirty stables where horse stands in urine and ammonia and the same irritates the legs and where the horse is in contact with limestone dust. In fact anything that irritates the glands of secretion of the legs may cause scratches. Some give disorders of the kidneys, intestines and liver as causes of scratches.

SYMPTOMS

The glands from the hoof to the knee that are in the skin for the purpose of secreting oil form inflammation and later scabs form with a very offensive secretion and the hair may fall out.

TREATMENT

Wash the effected part of the leg with a 1-500 solution of bichloride of mercury obtainable at any drug store. Bichloride of mercury is a

deadly poison so either destroy or place these tablets and any water containing them where no one or no animal can get them. After washing the sores rub them well with vaseline and in 3 days apply white lotion as follows:

Lead Acetate, 1 ounce (2 tablespoonsful)
Zinc Sulphate, 6 drams (6 teaspoonsful)
Water, 1 pint.

Shake well before using. If any of the causes for the disease given are present remove them. It may be the feed or the stable.

THRUSH OF THE FOOT

This disease is caused by a parasite that thrives in filth, such as is found in damp filthy stables.

SYMPTOMS

Thrush is a disease that usually works on the tissue of one foot at a time. In the gelding or stallion it is more often found in the front feet. In the mare it is found more often in the rear hoofs due to the position of the urine. There is a watery secretion given off from the frog of the foot. The tissues are swollen and dark colored. The fluid dries to a cherry mass after its escape. Sometimes the first noticeable symptoms is a very offensive odor, due to rotting of the frog, horn and sole.

TREATMENT

Cleanse the part with corrosive sublimate water 1-500. Corrosive sublimate is a most deadly poison and too much care can not be taken to prevent pills or water from being taken inwardly.

After thoroughly washing the parts melt tar and blue stone together and apply to the effected parts daily until improvement develops. I had good results by using powdered blue stone alone for several days.

PROLAPSE OF THE RECTUM OR PILES

This may be caused by feeding coarse fodders or excessive straining.

TREATMENT

Place the horse on a laxative diet and limit the amount of feed to

such feeds as mashes and linseed meal. Sprinkle the effected organ with sugar. After a few minutes the organ can be pressed back in place by the fingers.

Then take a deep stitch across the opening of the anus (not too tight) and keep it in place several days. Then cut the stitch and the rectum will usually stay in place.

LICE

Lice are more often found on the poll along the mane, and at the base of the tail. The hair gets shaggy, the horse loses flesh and carries a disagreeable odor.

TREATMENT

Take the horse away from the barn and curry him removing the hair to a fire.

Most generally these horses are noticed in warm spring days and if the weather permits they can be washed with any good dip used at the rate of 1 gallon to 30 of water. If the weather is cold Persian insect powder will give good results or melted lard and coal oil mixed may be rubbed over the effected parts.

CATTLE DEPARTMENT

IMPACTION OF THE FIRST STOMACH

("*Overloading of the Paunch*")

CAUSES

Overloading of the paunch is caused by the animals gorging themselves on a food which they highly appreciate, as when an animal gets to a grain bin or in a corn field. It may be caused by a sudden change of diet as from fodder to a rich pasture.

SYMPTOMS

The animal may strike at the belly with the hind legs, lay down but then soon rise again, arch the back, look around to the hind flank, extend the nose, froth saliva from the mouth and even try to vomit. The abdomen increases in circumference and the animal often flinches when pressure is applied to the paunch. Such animals exhibit signs of uneasiness.

TREATMENT

Above all things do not permit an animal that has eaten a gorge of green corn or grain to have water for at least 24 hours. Give all the salt they will eat. Nine times out of ten the animals will recover from any ordinary gorge without farther treatment. If an animal gets water nine times out of ten some of them will have to have attention if they have gorged. Do not feed for 24 hours, or till improvement is made and give the following in case they need attention.

The Nux Vomica should be repeated every hour.

Epsom or Glaubers Salts 1½ to 2 pounds.
Oil of Turpentine 2 ounces (4 tablespoonsful).
Tr. Nux Vomica 1½ drams (1½ teaspoonsful).
Water sufficient to dissolve the salts.

The above is for 1000 pound live weight and can be repeated in 8 to 12 hours giving turpentine once in 24 hours.

In drenching the cow do not throw the head higher than necessary as it causes difficult swallowing and may cause strangulation or go to the lungs and cause pneumonia.

If the paunch becomes distended with gas this may be let out with a sterile trocar or knife (see cut page 17, fig. 8.) A trocar excells a knife for it can be left in 24 to 36 hours. A pipe stem may be inserted after the knife is withdrawn to keep the opening of the paunch and the hide in line but be sure it is secure so it can not get into the paunch. In more obstinate cases an incision or cut 4 to 5 inches long is made high up in the paunch but parallel with the ribs and two-thirds of the contents of the paunch (no more) is removed. While doing this have an attendant hold the paunch and skin together so no food can fall between the paunch and the skin. After the food is removed wash the edges of the paunch with a rag moistened in a five per cent carbolic acid water solution (¼ pt. to ½ gal. water.) Then sew the outside edges of the paunch together by turning the edges or lips of the wound inward. No edges of the paunch will heal but the outside ones. Then sew up the skin in the ordinary way. Make the stitches 1½ to 2 inches apart out of sterile cat gut thread or several strands of well waxed cobbler's shoe thread.

DRY MURRAIN

("*Impaction of the Third Stomach*"), ("*Acute Gastro, Intestinal Catarrh*"), ("*Gastro Enterites*")

According to the more recent views of most men who have made this disease a study it can only be properly called by the last two names. They form that conclusion because dry murrain is very rare except that

gastro intestional catarrh is associated with it. However the feeding of dry coarse feeds such as wheat straw and corn stalks and shucks left by hogs seems to intensify or bring to its climax the catarrh especially when such feeds are not well supplied with water and salt.

SYMPTOMS

Usually animals affected with this trouble have previously been in an unthrifty condition. They have often been stupid, hide bound and a rough coat.

At the onset of the disease the body temperature is unevenly distributed. The horns are alternately feverish and cold at the base. diarrhoea and constipation often alternate. The appetite is diminished and the cow does not chew the cud. The dung may pass in balls instead of cakes. The stomach does not give the normal intestional sounds of health. When pressure is applied to the right flank pain is often evidenced. The animal gets poor and has sunken eyes, may live only a few days or they may last for weeks. This disease may be confused with hemorrhagic septicemia.

TREATMENT

Give 2 drams (2 teaspoonfuls) of hydrochloric acid 2 or 3 times daily. Give each dose in 1 quart of water or give 2 to 3 drams (2 to 3 teaspoonfuls) of creolin 3 times daily in 1 quart of water.

It is preferable to give either of the above in oil since they make the mouth sore unless well diluted.

If constipation exists 1 lb. of epsom salts may be given combined with ¼ lb. of ginger.

If diarrhœa is present it may be checked by the liberal use of boiled starch to a creamy constituency given as a drench and injected by way of the rectum.

2 to 3 drams (2 to 3 tablespoonsful) of tannic acid have beneficial effect in reducing diarrhoea. Give 2 doses every 24 hours in 1 pint of water.

DIARRHOEA, SCOURS OF CATTLE

CAUSES

Diarrhœa is caused by indigestible irritant foods, moldy foods, poisonous plants, foods containing a high per cent of water, foul water supplies, intestional paresites or tuberculosis of the intestional canal. If the scours is due to tuberculosis it is incurable.

SYMPTOMS

The passages of the bowels become thin and frequent, and unless checked the animal becomes thin and weak because they are not able to get the proper nourishment out of the food.

TREATMENT

If possible to locate the cause in the food change the ration. Often a change from dry feed to grass will check it or a change from grass to dry feed will often yield beneficial results.

A purgative or mild physic as ¼ gallon of raw linseed oil @ 1000 pound live weight should be given first to remove the cause of the trouble out of the bowels. It is useless to make a practice of locking the source of the trouble up in the bowels. After 12 hours any of the following should give good results to check the diarrhœa.

Give 2 to 3 drams (2 to 3 tablespoonsful) of tannic acid 3 times daily for a few days or 1 dram fluid extract of capsicum may be given 3 or 4 times daily. Give in 1 pint of water.

3 to 4 drams of bismuth sub-nitrate given 3 times daily has given me good results in diarrhœa. 1½ ounces of laudanum given every 3 to 4 hours is a preferred treatment for diarrhœa.

DYSENTERY

Dysentry is a severe form of diarrhœa usually accompained by the passage of blood and even shreds of the intestional canal.

The bowels should first be emptied by the use of ¼ gallon or 1 quart of raw oil. After 12 hours treatment should consist in giving drugs to quiet the bowels as

Capsicum 1 dram (1 teaspoonful) or

Lead Acetate 20 grains (one-third of a teaspoonful).

For 1000 pound live weight give either 3 times daily in 1½ pint of warm water.

The above should check the bowels after a purgative as recommended under diarrhœa.

Bismuth sub-nitrate is costly but may be used to check the bowels. Give 3 to 4 drams (3 to 4 teaspoonsful) 3 times daily till the bowels check and hold the bowels in check by ½ pint of wheat flour given 3 times daily.

FORAGE POISONING AND BRAIN TROUBLES OF CATTLE

(*Corn Stalk Disease*)

Brain troubles not only of cattle but of all live stock in most cases are caused by the food. It is a recognized fact among most veterinarians and stockmen that most brain troubles are due to troubles of the stomach. Stupor and brain disorder may develop solely due to the feed. So whenever the brain is effected look for stunted feed by excessive wet, drouth, or frost or mouldy improperly cured feeds for often therein lies the whole trouble. In dry years stock often consume a large portion of the stalks that would not be eaten under ordinary conditions. This makes a large per cent of indigestible food in proportion to the leaves and apparently causes a sort of chronic constipation which develops into brain troubles. Second growth and sometimes first growth cane and similar forages contain prussic acid, a deadly poison.

The molds on fodder and ensilage and in fact any decaying vegetable or plant material sometimes form ptomaine poisons. These are the poisons found in canned vegetables that have kept improperly.

These causes are not infrequent causes of brain disorders in stock.

Salt is excellent to stimulate gastric secretions and its use has a tendency to avoid chronic constipation.

Corn stalk diseases may be confused with black leg or hemorrhagic septicemia.

Brain disorders are sometimes caused by injury to the spine or central nervous system.

TREATMENT

Remove the cause if it is to be found in the feed and give a good physic as 1½ pounds epsom salts in 2 quarts of water for each 1000 pounds live weight. If the bowels do not move in 24 hours repeat the dose or give ½ gallon of raw linseed oil to clean up the bowels.

3 to 4 drams (3 to 4 teaspoonsful) of Tannic Acid or
1 to 2 ounces (3 to 4 tablespoonsful) of Oak Bark Tea

may be beneficial if given 3 to 4 hours after the salts.

CHRONIC INDIGESTION

(*Loss of the Cud*)

The first stomach (rumen) of normal cattle and sheep has the function of returning food to the mouth that is not sufficiently chewed for digestive purposes. When the digestive apparatus loses this function farmers sometimes call it the loss of the cud which is not improper if they recognize the base of the trouble is in the digestive apparatus.

CAUSES

Chronic indigestion more often attacks aged cows that have been hearty eaters and have been fed coarse dry feeds. Chronic indigestion may attack young cattle. I have had several cases among yearlings. Dry coarse feeds as corn fodder, straw, hay or dead grass are all inducive when fed in cold weather for a considerable period without salt and sufficient water is not drank for digestive purposes.

A cow may be fed dry fodders in the winter and a run down condition be the only noticeable symptom but if they have lost the ability to chew the cud a lot of symptoms may develop while they are on green grass; again the condition may improve when they are turned out on the grass.

SYMPTOMS

Loss of cud (Rumination) grating of the teeth, loss of appetite, weakness and a disposition to lie down a great deal. The eyes become sunken and the hide becomes leather like. The bowel passages become hard or may alternate with diarrhœa. The paunch becomes enlarged with gas (bloat) which in older cattle seldom causes misery, but may occur day after day in old or young cattle and may be the outstanding symptom in young cattle. The symptoms usually develop slowly.

TREATMENT OF CHRONIC INDIGESTION

In aged cattle where the symptoms have been months developing treatment is not always satisfactory. The feeding of a laxative and easily digested food is most important in this disease. Five or six gallons of milk may be fed to a cow weighing 1000 pounds. Some will drink it like water. I do not favor giving milk and ensilage together, however no feed is better than ensilage for chronic indigestion; the acid seems to effect the blood and gives tone to the digestion that can be found in no other feed. If silage is not available green wheat, rye or short tender grass are next to be preferred. Bran mashes with a little salt, boiled oat meal, flour gruels, raw eggs, ground oats and oil meal or finely chopped alfalfa or clover may be given. Give plenty of water with the chill taken off.

MEDICAL TREATMENT

Give the animal a physic of epsom salts. If they are not too weak two pounds may be dissolved in water for each 1000 pounds live weight. If they are weak a smaller dose is best. 24 hours after the salts are given begin giving creolin. 1½ drams (1½ teaspoonful) may be given every 8 hours in ½ pint of raw oil as a drench. This should be continued for several days or till they improve. For cattle weighing 500 pounds give ½ as much creolin. The above dose is for 1000 pounds live weight.

Bloating may be checked by giving 2 to 4 tablespoonsful of baking soda before feeding.

CONSTIPATION

Constipation is not of infrequent occurrence among stabled cattle allowed access to only a limited range during the winter months.

It frequently happens such cattle when fed dry constipating feeds and due to coldness they drink an inefficient supply of water for digestive purposes and they becomes constipated. Constipation may also occur in diseases having fever associated with them.

SYMPTOMS

Cows that become constipated have diminished appetites which is usually variable. That is they may eat fairly well in the morning and at

night leave a portion. The milk production decreases and they apparently lose their energy. The passages of the bowels often take the form of balls rather than cakes. If constipation is due to fever about the only guide is the condition of the bowel passages.

TREATMENT

Constipation due to housing can be overcome by inducing the cattle to take exercise every day and in addition replace some of the dry feed with a laxative feed as green wheat, ensilage, oil meal, bran or clover hay. Sometimes taking the chill off of water by the use of a tank heater not only induces cattle to drink a sufficient amount of water for digestive purposes but will pay for itself in increased milk production made.

If constipation is due to fever of disease often the difficulty can be overcome by the addition of a laxative feed but it may be necessary to give 2 to 3 pints of raw linseed oil which is a laxative and has not the griping or weaking powers of a more drastic physic.

NON-BREEDING COWS

(*Sterile Cows*)

Non-Breeding cows are more often found among excessively fat or poor cows or those that have not had all the afterbirth removed after calving. Occasionally a cow is naturally deficient in the organs of generation and will not breed. Such a cow usually has a masculine head that could not be told from a steer's head if the head were all you were privi eged to see. When the cows are too fleshy the excessive fat around the organs of generation often causes the trouble. When the afterbirth is allowed to rot away instead of being properly removed, pus forms and may effect the tubes between the womb and ovaries or the womb proper. Sometimes these pockets can be removed and antiseptic douches applied and the cow will conceive. The douche should be given several days before breeding. Cows effected with contagious abortion often will not conceive.

CONTAGIOUS ABORTION

No recent disease of cattle has caused the financial loss and discouragement to the cattle owners that contagious abortion has caused.

The annual loss from contagious abortion is placed at more than ($50,000,000) fifty million dollars.

Veterinarians of experiment stations and others with broad ideals have been laboring very diligently on this disease. Generally the cattle owner does not want it known his herd is effected and often closes them out at public sale and thus the innocent purchaser often takes the disease into a well herd. To some extent this secrecy has really kept the veterinarians of the state from knowing the prevalence of this disease. The disease is caused by a germ found by Bang in 1895. Oftentimes a neighbor can not get his cow to conceive to his bull and gets a neighbor's bull to serve her. If she has contagious abortion it may be carried by the bull to the next few cows he serves. The last statement is of importance and should be carefully read by all. There is much less likely hood of a bull carrying the disease from an infected cow to a well one if his sheath is washed several times after serving an effected cow. This can be done with a bulb syringe, wash several times well up under the sheath. A cow may develop this disease by eating food having mucous on it from an effected cow. Blood may be drawn out of the juglar vein by tieing a string around the neck. In front of this string the vein can be felt. Puncture it with a hollow needle and run the blood in a clean narrow long bottle. Keep upright at least 4 hours and send to the experiment station and they can determine whether contagious abortion or some other form exists. A higher per cent of cows react than bulls, hence it is generally supposed that the bull carries the disease chiefly in a mechanical way that is the infection is left on his organs from an effected cow and thereby transmitted to the well ones of the herd.

Do not sell effected cows if they are of any value. In a very high per cent of the cases if a cow is properly cleaned a few times with antiseptic solution after the afterbirth is removed they will bring a normal calf the following year. That is to say a cow develops of her own accord an immunity against the disease; yet there have been some people who have induced the farmers to believe the medicine they use will ward off the following attacks when the cow herself develops the immunity. To prove this statement ask the man who has refused to sell his abortive cows and see if he doesn't tell you a high per cent of his cows produced normal calves the following year without treatment, provided they were properly cleaned and conceived when bred.

The calves when born normal from an abortive mother react to the disease for only a few weeks after birth.

SYMPTOMS

The discharge thrown off at the vagina is often a dirty yellowish white instead of a clear white. To find a premature calf either in the field or lot may be the first evidence and often we try to convince ourselves it's due to bank climbing, butting, or slipping as we know of no abortion in the community but as we reflect our bull has served a neighbor's cow we have bought a previously used bull or brought into the herd some new stock. Straining may be the first evidence seen. Oftentimes difficult calving with a high per cent of loss of the calves is the first trouble we encounter. If the calves are born alive they are often indifferent about nursing. It is seldom that all the cows of a herd abort. However the ones failing to abort the first year may abort the following year thus continually transmit it to the younger cows if proper steps of prevention are not taken. The cows usually have more difficulty in shedding the afterbirth than normal cows which is partly due to premature birth of the calves.

TREATMENT

The afterbirths should be removed and burned with all infectious material where the birth took place. The afterbirth can be removed by pinching the buttons or cotyledons loose from the wall of the womb with the thumb and fingers.

After removing the afterbirth, wash the womb out by the use of a 2 foot piece of rubber tubing (see cut on page 17, fig. 7.) Place in one end a funnel and place the other end in the womb. Pour a mixture of ¾ level tablespoonful of potassium permanganate in 1 gallon of water into the womb; repeat every two days for one week. A new method with which I have had very good success in the removal of the afterbirth is to plug up the opening to the womb with a role of bandage to which is tied a soft strong cord. Also tie a similar cord to the afterbirth. Leave the plug in from 5 to 7 days examining every day or so to see that the bandage plug is still in the womb opening. After 5 days the afterbirth can often be easily removed. The plug is to keep the opening of the womb from closing. Turpentine held under the navel seems to be of benefit in the removal of the afterbirth in some cows. Treat both the effected and the pregnant cows as follows to prevent farther aborting. Mix 5 tablespoonsful or 2½ ounces of pure crystals of carbolic acid in ½ gallon of water. With a hollow needle hypoder-

mic syringe (See cut page 17, fig. 4) inject under the skin 6 drams (6 teaspoons) of the mixture. Repeat every week or ten days until six treatments are given increasing the dose a little each time after the second treatment. Poisoning and the full dose is indicated by dilation (enlargement) of the pupils of the eye and staggering of the cow. Some veterinarians have figured it out by the amount of blood in the cow and formed the conclusion that such a small amount of carbolic acid could have no antiseptic effect doubtless they are right. It is probable the drug increases the number of white corpuscles of the blood that destroy the disease germs and thereby prevent farther abortion in a herd. However I know the above treatment is beneficial in abortion. I have used it a number of times in abortive herds and have obtained excellent results. If a cow is straining give

2 ounces of Extract of Black Haw.
1 ounce of Laudinum.
1 pint of Water.

Repeat this every hour till straining is relieved or 3 or 4 doses are given. In connection give carbolic acid as outlined above under the skin every 48 hours till straining is relieved. Isolate all effected cows from the herd until they throw off no more mucous from the womb.

There is an abortion bacterin being used costing about $1.00 a dose per cow for sale by laboratories. See list of laboratories on the last pages of this book. This bacterin seems to be fairly successful. The bacterin would simply replace the carbolic acid treatment.

PARALYSIS OF THE HIND QUARTERS OF COWS

Partial paralysis occurs occasionally in cows. The most frequent form occurs in the hind quarters of old cows a few days prior to the delivery of a calf. Usually such cows are in poor condition.

SYMPTOMS

The cow often can not be induced to stand and support herself. Colicky pains are indicated by groans and turning of the head to the sides. The cow usually improves after the delivery of the calf.

TREATMENT

This is one disease the care-taker must not grow impatient with. First of all feed the cow a liberal ration of laxative and nourishing feeds such as clover, hay, oats, oil meal and several gallons of raw milk daily.

Give the cow all the water she will drink. If the cow will try to stand, prepare a gunny sack sling by sewing gunny sacks to poles and rolling the cow on to it (see cut on page 55) and pulling the cow upon her feet with a hay rope. If the cow is indifferent about standing do not try to force her to stand. The sling is not to be used to force the cow but rather to aid her in standing. If the cow does not show anxiety to stand she should be turned from side to side several times daily and the limbs should be rubbed several times daily by the hands.

A liniment made as follows and applied two times daily to the legs and limbs may be beneficial.

Chloroform 2 ounces.
Camphor 2 ounces.
Water of Ammonia 2 ounces.
Raw Oil 6 ounces.

The strength of the liniment may be diminished or increased by reducing or adding more raw oil.

Give every 8 or 12 hours, 1½ drams (1½ teaspoonful) of tincture of Nux Vomica for each 1000 pounds live weight and continue till improvement occurs or poisoning is indicated by twitching of the muscles of the cow. The twitching is quite similar to that seen in frog legs that have been prepared for food. If the bowels are constipated salts may be given. Salts that have long been exposed to the air are not effective. There is nothing better for paralysis than nux vomica.

DIFFICULT CALVING

(*Difficult Partuation*)

Contagious abortion is probably responsible for more difficulty at calving time than any other one cause. In contagious abortion the calves often come dead, wrongly presented or dry. Some come premature. All this is unnatural and trouble follows. Wrong presentation and too large a calf for the opening may cause difficult calving.

The calves back should be toward or parallel with the cows since the pelvic opening is not round but has more depth between the spine and

the base of the pelvic opening than it has the other way. If a cow seems to be having difficulty lard the hand and arm with lard to which has been added a little carbolic acid explore the opening to the womb and see if the feet and head can be felt coming as they should. If they are do not bother the cow for several hours after the pains begin. If the feet and head are not coming right gently push the calf back as far as possible when the cow is not straining. When she strains merely hold what you have. To raise the hind quarters higher than the front may aid in pushing the calf back. After the calf is back as far as possible bring up the fore feet and the head. A calf can never be born with a foot or the head back neither can they be straightened until pushed back. A calf can sometimes be born hind feet first. If the front feet and the head are brought up to place go away and let the cow labor; maybe she will have the calf without aid. After some time if the calf is not born return and pull on both front feet, pull gently and firm. To turn the cow over on the other side may make delivery easier. The calf may come easier if the cow will stand up. Lard may assist in the removal of the calf. When the head gets to the opening maybe the membrane can be pushed over the head.

After the head is out work gently and easy unless the calf is chokeing. When the ribs are well out to pull toward the cow's hocks will assist the birth. If wire streachers and ropes have to be used grease the calf well and pull slowly lest the cow and calf both be lost. However the hands are all that should be used for some time. To take calves and be successful requires time and patience to let the opening naturally enlarge. 1 teaspoonful of pituitrin injected under the skin is often very beneficial in aiding in calving. Make the injection in the loose skin of the cows neck.

RETENTION OF THE AFTERBIRTH

In my opinion contagious abortion can be in a herd and apparently healthy calves be born. This may account for the difficulty in cleaning in some herds.

After calving, especially difficult calving, the cow should be washed out with 6 ounces (12 tablespoonfuls) of sheep dip placed in 1 gallon of luke warm water. This can be done by the use of the funnel and tube shown in cut (on page 17, fig. 7). Insert the tube and hold the funnel high and have an assistant pour the dip water in the funnel. This aids in the afterbirth removal. Do not take the afterbirth away before

18 hours. If the buttons are pinched loose from the wall of the womb sooner unnecessary bleeding occurs. If the afterbirth does not come in 12 hours after the birth of the calf take a Mason fruit jar lid and hold it under the cow's navel and allow the navel to take up 4 or 5 tablespoonsful of turpentine. This seems to aid in some cows within 5 to 15 hours while in others the arm must be inserted and the buttons pinched from the wa l of the womb with the thumb and fore fingers and the afterbirth removed a piece at a time.

The calf bed is fastened to the womb by buttons which naturally rot off from the wall as the calf reaches maturity but in premature births these buttons do not seem to reach that stage. A cow that has such trouble should be cleaned up and washed out 3 or 4 times a week to prevent her forming pus and becoming a non-breeder.

WHITE SCOURS

(Contagious Scours in New Born Calves)

This disease occurs in many sections of the United States and unless proper precautions are taken it will ruin a herd of calves.

CAUSES

The infection or germ of the disease will live for years in a building if unmolested. The bacteria causing it are very hard to kill by methods that would kill any ordinary disease germ.

It usually travels from one herd to the other by clinging to men's shoes, wagons or the feet of cattle.

SYMPTOMS

The calves are invariably attacked before they are three days old and they often die within forty hours after the first symptoms appear.

Possibly four or five calves out of a hundred in an infected herd escape the malady unless proper preventive measures are adopted.

White scours causes the calf to grow indifferent about nursing, they become weak rapidly and give off a whitish yellow, stinking discharge. It is distinguished from abortion by the scours and all calves being born alive.

PREVENTION

There has recently been a bacterin developed to prevent this disease which gives quite satisfactory results. These bacterins may be obtained through local druggists or purchased from laboratories listed in the last

pages of this book. All bowel passages should be collected 2 or 3 times daily in a vessel, covered with lime and buried in an isolated spot away from all lots and buildings. This is done to prevent the disease spreading. After the disease is discovered do not allow any more cows to calve in the infected building and if possible do not permit any one to go from infected pens to pens where pregnant cows are to calve without changing the clothes and shoes. After the calves are 10 hrs. old a good plan is to dip the navel of all calves born after the disease is discovered in the following disinfectant solution

4 tablespoonfuls of carbolic acid to 1 quart of warm water After the navel cord is disinfected tie it with a smooth soft cord.

The walls, floor and ceiling of an infected barn should be washed with one of the following solutions

5 per cent Creolin (10 tablespoonsful @ gallon of water).

5 per cent Carbolic Acid (10 tablespoonsful @ gallon of water).

5 per cent Formalin (10 tablespoonsful @ gallon of water).

Clothing etc. may be boiled.

ORDINARY SCOURS. DIARRHOEA OF CALVES

(*Indigestion*)

This disease is much more prevalent on some farms than others, possibly due to the feed, water or continually having calves in the same building year after year. Ordinary scours occur after calves are 5 or 6 days old and seldom after they are a few months old.

The following reasons are given as the cause of scours. Failure of calf to receive the first milk (colostrum) of the cow, cow receiving food that produces milk of acid composition or too rich in fats, (ensilage may cause acid milk), cow giving more milk than the calf should receive, dirty milk, or feeding buckets, calf eating solid foods before the digestive tract is sufficiently developed to receive them. Lice may cause scours. Irregularity of time or amount of milk given. Cows eating moldy feeds or highly acid feeds as ensilage. I am of the opinion ensilage is to blame in more cases than formerly supposed, by producing an acid effect on the milk.

SYMPTOMS

The bowels move frequently and the passages contain a high per cent of water. The little patient loses the appetite, becomes gaunt, stupid

and the breath and bowels emit a foul odor. Later grating of teeth occurs which indicates indigestion in any animal.

TREATMENT

Scours in calves is not an incurable disease however it requires lots of patience in many cases to perfect a cure.

It is as useless to indiscrimately pour medicine down calves without locating the cause of the trouble and removing it, as it would be to doctor a horse for colic caused by green oats and continue to pour the oats into him. Feed the calf for nourishment ½ dozen raw eggs daily and not to exceed 1 gallon of milk per day given preferably in three feeds. If the calf is very bad off the milk should be slightly reduced. I do not favor boiling the milk. Boiling destroys the ferments and makes the milk less digestible.

Above all things be very clean with the milk and see to it the calf gets it at the proper temperature. The cow buckets and hands should all be very clean when milk is drawn from the cow. If the calf is nursing the cow often to reduce the amount given the calf will aid in curing scours.

See to it that the cows feed is not the cause previously discussed under causes of this disease.

There are a number of home treatments for scours in calves but my success with them has not been by any means satisfactory. Among them are coffee, eggs, inner bark of white oak boiled and 3 to 6 tablespoonsful of the clear tea given three or four times daily. Flour boiled in a sack two hours and sliced into the milk after the flour becomes dry, raw flour, scorched flour, corn starch gruels and rectum injections of corn starch, gum arabic, etc. It is probable most of them have some benefit but their use has been all but satisfactory in my hands.

I find it best to give lime water and gentian 3 to 4 times daily made as follows from the beginning of scours till after the attack is over. Take ½ pint of lime, pour over it ½ gallon of boiling water in an earthen crock. Stir vigorously several times then let settle, pour off the perfectly clear liquid and give 1 or 2 tablespoonsful with 2 teaspoonsful of gentian 3 or 4 times daily. It makes no difference what the other treatment is, give the lime water and gentian.

Following is a formulae which some people claim good success with and with which I have had good success if given when scours first appear.

Glycerine 1½ ounces (3 tablespoonfuls).
Pulverized prepared chalk 5 ounces (10 tablespoonsful).
Peppermint Oil 20 drops.
Camphor 3 drams (1½ teaspoonfuls).
Sub-Nitrate of Bismuth 3 ounces (6 tablespoonsful).
Water 1 pint.

The bismuth sub-nitrate is comparatively costly and may be reduced to one or two ounces and good results be obtained. Give 2 tablespoonfuls twice daily as a drench in a little milk has given me most excellent results. Shake well before each dose. Take 1 ounce of tannoform (*methyl di tannan*) put in 1 pint of water. If the local druggist has not tannoform in stock he can order it. Where it is in stock, it will be found cheap and very efficient. Give 2 tablespoonsful 2 to 4 times daily in ¼ pint of warm water. This formulæ may be preceeded 12 hours by 6 tablespoonsful of castor oil.

Another cheap one and most dependable in my opinion is as follows:

Give 2 ounces, (6 tablespoonsful) at one dose, followed in ten hours by

20 to 25 grains of salicylic acid, (1 rounding teaspoonful.)
20 to 25 grains of tannin, (1 rounding teaspoonful.)

Give salicylic acid and tannin in 3 ounces (6 tablespoonsful of water. Give 2 to 3 times daily. Give lime water and gentian from the beginning 3 times daily till after they are cured.

Following is a fairly good treatment. Give 3 ounces (6 tablespoonfuls) castor oil follow in 8 to 10 hours by ½ dram (½ teaspoonful) of subnitrate of bismuth given 4 times daily in 5 or 6 tablespoonsful of water. Give lime water and gentian as outlined above. This treatment is successful in a high per cent of the cases. If it fails to produce stools or cakes after 7 doses are given then continue it but give in addition 1 to 1½ drams (1 to 1½ teaspoonsful) of tincture of opium (laudanum) every 4 hours til the bowels get right.

After the bowels are checked 2 drams (2 teaspoonsful) of tincture of gentian and lime water should be given 3 or 4 times daily to keep the stomach sweet and aid in digestion.

There is an anti-scour bacterin on the market which is fairly successful to immune calves for scours. For sale by veterinary supply

houses listed in the back pages of this book. It costs about 75c for each calf immuned and should be done soon after birth. Bacterins are injected under the skin.

CONSTIPATION OF CALVES

The first milk of the cow is called colostrum and acts as a natural purge or mild physic to the young calf. If this happens to be the wrong composition due to the feed of the cow it fails to move the bowels and the young calf becomes constipated.

Constipation often follows diarrhœa in calves and often diarrhœa terminates in indigestion and the use of medicine for diarrhœa must be continued.

SYMPTOMS

The calf strains without producing a passage may have colicky pains and a bad breath associated with constipation. Grating of the teeth indicates indigestion.

TREATMENT

The calf should receive luke warm water injections by the way of the rectum. Four or five tablespoonfuls are usually sufficient. The frequency and the amount depends on how much of the water is retained. In the worst forms of constipation 2 ounces (3 or 4 tablespoonfuls) of castor oil should be given by the mouth.

If constipation follows diarrhœa ¼ to ½ teaspoonful of pepsin 2 or 3 times daily may be given 10 to 15 minutes before feeding. Lime water and charcoal are good for foul breath in indigestion. 2 teaspoonsfull of charcoal and 1 tablespoonful of limewater may be given three times daily. Lime water is made by placing the lime in a glass and stirring it several different times with water. Then allow the lime to settle and use only the clear transparent water.

RING-WORM OR SCABS OF CALVES

This is a vegetable paresite of calves. Gray, dry, white scabs appear around the eyes on the nose or neck and sometimes on the body. The hair becomes brittle and breaks off leaving the grey spot.

Wash the effected parts with raw oil, castor oil or vaseline three or four times and apply once daily for 3 or 4 days tincture of iodine.

WARTS ON CALVES

Warts are not hereditary. They may be cut off by the use of a strong sharp thread. Place the thread around the base of the wart and continue to draw it tighter every day until the wart is removed. Then secure some vaseline and smear the hair all around the wart and paint the wart very lightly with nitric acid applied by a smoothed end glass rod. If the wart starts to grow again apply the acid again. They should be examined once a week to determine whether they are going to grow again or not.

SORENESS OF THE FEET OF CATTLE

There are several causes for soreness in the feet of cattle. Probably the most common cause is a fungus growth appearing between the claws on the heel portion of the foot. This may be easily detected by raising the foot and cleaning away the dirt from the heel. Overgrowth of the claws is a common cause of lameness.

TREATMENT

In case of fungus wash all the dirt away and apply two times daily clear concentrated blue vitrol water made by pouring hot water on pulverized blue stone stirring it up well and allowing it to settle and pouring off the clear solution. Then bathe the diseased part of the foot in the water twice daily for four or five days. Pulverized blue stone may be dusted in between the affected places where the trouble is. Proper trimming will remedy over grown claws and removing foreign obstructions, will remedy hardening of foreign matter formed between the claws.

CONTAGIOUS FOOT AND MOUTH DISEASE

This disease has been known in Europe since about 1750. Minor outbreaks occured in eastern states in 1902 and 1906. In 1914 a considerable area of the central western states were refused the privilege of shipping stock due to one or more outbreaks in each states.

Europeon countries have learned that quite a large per cent of the cattle die from this disease in some outbreaks while other years where good care can be given to the animals the mortality is very low. Foot and mouth disease attacks hogs, cattle, sheep and goats and no susceptible animals in a herd escapes it. It is the most contagious of all diseases ef-

fecting live stock. It causes fat cattle to lose flesh, stock cattle refuse to gain, cows udders blister, cake and they become worthless and pigs become lame. Any effected animals may recover and have three or four subsequent attacks within a period of several months.

In Germany and France where the malady was not strictly quarantined in the beginning and has become wide spread they do not seem to be able to get rid of it during a period of 30 years. These facts should make every American farmer want to support the government and state in quarantine measures so that he may avoid an aquaintance with this disease.

CAUSES

This is beyond a doubt a bacterial disease. The agent causing the

(Sores on the teats due to foot and mouth disease.)

infection undoubtedly is in the blisters formed in the mouth. A common drinking trough or feeding trough can easily become infected by the excessive flow of saliva and thus infect a whole herd. It is one of the easiest diseases known to spread. It can be carried even easier than hog cholera on the wagon wheels, shoes, clothing and in fact any article that goes from diseased to healthy quarters. The manure, urine, milk and saliva all carry the infection.

SYMPTOMS

Ergotism or poisoning due to a fungi which grows on forage plants

which is sometimes called "non-contagious foot and mouth disease" is often mistaken for contagious foot and mouth disease. Sheep and hogs do not easily develop ergotism while they develop foot and mouth disease in a very few days when confined with infected animals.

With contagious foot and mouth disease quite a number develop the disease in a few days while with ergotism the cases usual y develop slowly or no new cases develop if the food is entirely changed to food of plants, not growing ergot (See index for ergotism.)

Characteristic flow of saliva of an animal effected with foot and mouth disease

Animals with contagious foot and mouth disease become stupid and dull with a rapidly reduced flow of milk. The base of the horns, ears and muzzle become dry and feverish. The tops of the hoofs may become feverish.

At the onset of the disease the flow of saliva is not materially increased but as the disease advances it flows in shreds from the mouth

with a characteristic smacking. The appetite is reduced partly due to the blisters which appear in the mouth. The animal manifests uneasiness and tenderness in the feet due to blisters which more often appear on the heels. These blisters vary in size from a flax seed to half an inch in diameter the larger blisters are often the result of the fusion of several smaller blisters. These blisters may be flesh colored or have a whitish yellowish appearance. They may be found on the nose or the upper

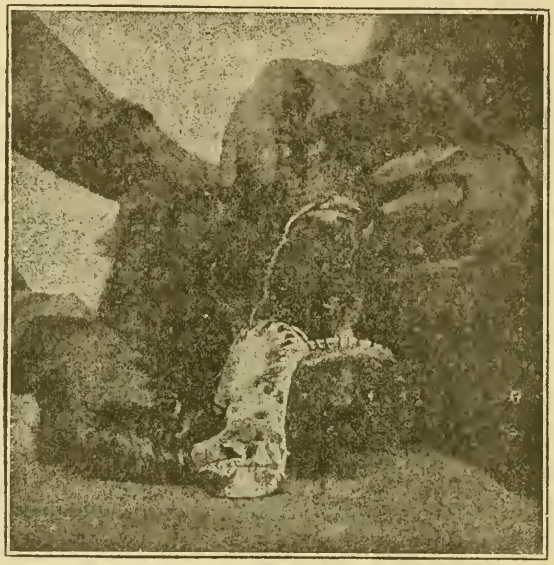


Fig. 2—Blisters and scabs of foot and mouth disease on the mouth. Note rubber glove.

gums as well as on the tongue. When these blisters appear on the feet and the animal is exposed to manure and filth they may lose the hoofs. Sheep and pigs are more often effected in the feet.

PREVENTION OF FOOT AND MOUTH DISEASE

The state veterinarian and his deputies are paid by the people of the state to render assistance in the control of such contagious diseases.

However, the farmer is not helpless while waiting on the state to render such assistance. The farmer should be aware of the fact that he is dealing with a very contagious disease and must always be on the guard to prevent it from spreading.

First isolate all sick animals and any new cases that may develop to a building some distance from all other stock. If possible supply a hydrant or close well for water, necessary troughs and feed sufficient for several months. Getting such a supply at first aids in preventing the spread of the disease. Place one man in charge of the animals and absolutely keep every body else away and remove nothing from the building that is taken there, not even the animals that recover for they may have several attacks. The man in charge of the sick animals must not leave the infected pens without changing all clothes, including shoes, washing the hands and face thoroughly through several soapy waters and placing on clean clothes. Do not let the man touch the infected clothes after washing and do not let the clean clothes come near the infected clothes or pens.

Keep the infected pens clean but do not throw the manure where it will be washed by rains, use barrels of lime with the manure. Keep some lime on the floors of infected pens. This disease can be kept from spreading in small lots much easier than if cattle or hogs are allowed much range.

All of the herd showing no symptoms should be kept on a small area for at least two weeks and each animal should be tied and fed and watered in individual buckets. That is each healthy animal should have a bucket to eat and drink out of and no other healthy animal should be fed out of the same bucket. Any new cases developing should be placed in the pen with the sick ones. Use plenty of lime where such animals are kept. The man caring for the sick animals must not come near the well animals. Neither must any article used about sick animals be removed from in or about such pens.

After the disease is over the building and surrounding ground must be thoroughly disinfected by burning all manure and disinfecting by the use of formalin, one pint to the gallon of water.

ERGOTISM

(False Foot and Mouth Disease)

There is a fungus called ergot that grows chiefly on rye, red top, blue grass and timothy during wet seasons. It is to be found on the seed portion of the plant. The seeds effected with ergot attain several times their normal size have a hard shelly covering are black and often crescent shaped. This disease is more likely to occur where stock are on dry feed and consuming the seeds. This disease may be mistaken for

contagious foot and mouth disease but differs from foot and mouth disease in the following points.

I Ergot poisoning seldom effects hogs and sheep while they are quite susceptible to contagious foot and mouth disease.

II Within a period of 10 days after an outbreak of foot and mouth disease a high per cent of the herd will be effected while with ergot poisoning quite a per cent of the cattle usually escape the disease.

III The sloughing of sores is more extensive in ergot poisoning than in the contagious foot and mouth disease.

IV It would be rare to find ergot on the food of animals suffering with the contagious foot and mouth disease.

SYMPTOMS

Ergot makes its appearance in two separate forms. I Internally. II Externally.

When the internal form is present it somewhat resembles forage poisoning. The animals become dizzy, reel, froth at the mouth, show colicky pains, may abort the calf, become paralyzed and die or recover within a period of hours.

In the external form the parts of the body farthest from the heart as the ears, legs, tail etc. become effected because the circulation is poor. In such cases the skin becomes dry and cracks appear. These cracks grow in size until they become great sloughing sores. They may assume the shape of patches or they may encircle the effected portion of the body. These sores may become extensive enough to cause the loss of a foot, ear or tail. An animal effected with the external form usually recovers after a period of weeks if the food is changed.

TREATMENT

Give 2 to 4 tablespoonfuls of tannic acid in water as soon as possible after the disease appears. In the internal form give a good physic to prevent the system from absorbing more of the poison. 1½ to 2 pounds of epsom salts for each 1000 pounds of live weight should be given. Change the feed to clover, alfalfa, oil meal, bran, etc. not effected with ergot.

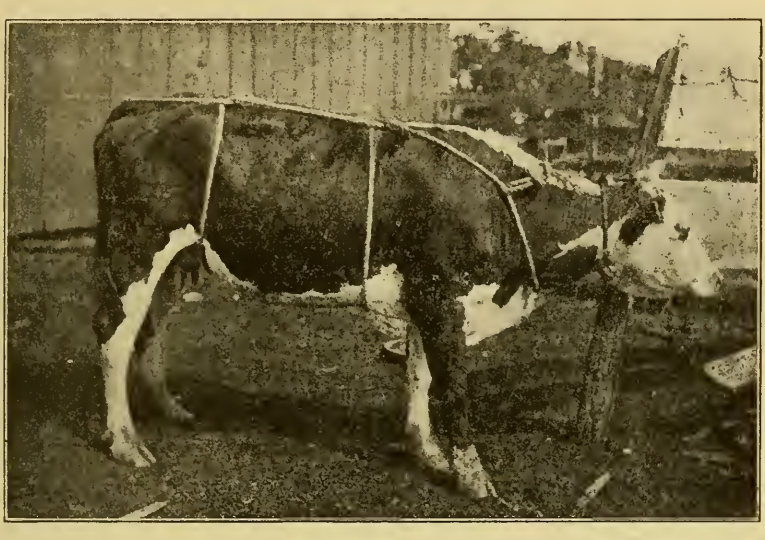
In the external form change the feed and give daily from 7 to 9 days 1 dram (1 teaspoonful) of Potassium Iodine 2 times daily in 1 pint of water.

If improvement does not take place omit several days and repeat the

treatment till the hair becomes scurffy or tears drop from the eyes. The last two symptoms indicate enough of the drug has been given. However if they do not appear at the end of the first 8 days the dose may be increased one third.

LUMPY JAW

(*Actinomycosis, Wooden Tongue*)



An easy and effective way to throw cattle. The head is tied and the rope encircling the body is drawn tight.

This is a fungus disease of the blood effecting cattle and occasionally horses and hogs. The fungus grows on forage and beards of small grains as rye, barley, oats and wheat. It also grows on the grasses in pastures and hay fields. The fungi probably gain entrance to the blood by the irritation of heads or sharp ends of straws. However it is probable that thorns and other wounds would make an opening to the blood.

SYMPTOMS

This disease may appear in the form of one centralized swelling or several small swellings or internally as wooden tongue. In the last form the tongue becomes enlarged and useless. The animal has difficulty in eating. For this form give potassium iodide treatment only. The swellings on the exterior of the body appear chiefly on the sides of the head

and between the angles of the lower jaw bones. However I have seen swellings of lumpy jaw appear on the neck and body. The swellings may be hard in which case the pus is enclosed in fibrous tissue or they may be soft and pus like. It is sometimes difficult to determine definitely whether or not a swelling is present until the cow is roped and the place is felt of with the hand.

If no treatment is given small scattered lumps may break for a few months, scattering the disease over the farm and the disease finally result in developing one or more big lumps which later results in destruction of both tissue and bone.

TREATMENT

If a lump breaks collect all pus and burn it to prevent contaminating other cattle.

I have had a great deal of experience with this disease and recommend that treatment be given as soon as the case appears. Before the lumps form pus or fibrous tissue develops the following inexpensive liniment often gives excellent results. After fibrous tissue forms it will stop growth of the swelling but often leaves an enlargement which may disappear after months.

Oil of Sassafras, 2 ounces
Oil of Turpentine, 4 ounces
Raw Linseed Oil, 4 ounces
Croton Oil, ½ ounce.

Apply 2 times 12 hours apart to all lumps rub in well. Omit 4 to 7 days after 2 applications are given and apply again unless the swellings are decidedly better. Two applications usually cures; however, keep up the application till distinct improvement occurs or 4 applications are made. The liniment will remove the hair.

The United States Government cured about 90 per cent of the cases it tried at the union stock yards at Chicago by the use of potassium iodide. One rounding teaspoonful should be given twice daily in 1 pint of water to mature cattle for eight days or till symptoms of poisoning are indicated by watering at the eyes, nose and scurfy hair. After these symptoms appear omit 1 week to 10 days and unless the beast is decidedly better give 2 doses a day for 7 or 8 [illegible]

Surgery has long been used in lumpy jaw where the pus is drained out and the fibrous tissue is cut away. However in advanced cases where the bone is not effected I have had far better results to lance the

lumps on top and fill the cavity full twice during 24 hours with blue stone. In 3 to 5 days all the fibrous tissue must be rem ved. Healing may be hastened by sewing up the cavity and keeping it open for several days at its lowest point to allow pus to drain out.

TEXAS FEVER

(*Piroplasmosis*)

This disease is known by the names of red water, texas plague, splenic fever, spanish fever, murrain, etc.

This disease is of little importance where there is no exchange of cattle between the north and the south, however where northern cattle go south or tick infected cattle go north it becomes quite an important disease in many cases. The boundary line of Texas fever begins at Norfolk, Va., runs southwest to the northern boundary of Georgia, thence north to the center of Tennessee, then west to the Mississippi river then north to the Missouri-Arkansas line. Then it follows the Oklahoma line to Medford and goes southwest to the old Mexico line leaving the west third of Texas free. Then it follows the old Mexico line till the southeast corner of California going one half the way up to the Arizona line thence west to Watsonville, California. The tick is unable to live through the freezing weather it must undergo north of this line, hence the malady is checked with cold weather north of such a line.

Cattle coming from the south are very likely to carry the ticks into northern pastures unless they are dipped in vats containing dip water of sufficient strength to kill the ticks. Just how the disease is spread can not be understood unless we examine the life history of the cattle tick.

The eggs of the tick are laid on the ground hatching into a six legged active tick resembling a beetle in appearance. The time necessary for such an egg to hatch varies from 13 to 90 days depending on the temperature at this stage the little fellow is visible to the naked eye and apparently get no larger till they attach themselves to cattle. The skin on the inner portions of the thighs. The base of the udder and the sheath are the places preferred by the tick to attach themselves to cattle, however they can often be found on most any portion of the surface of the body of cattle especially along the back and on the neck. After the ticks

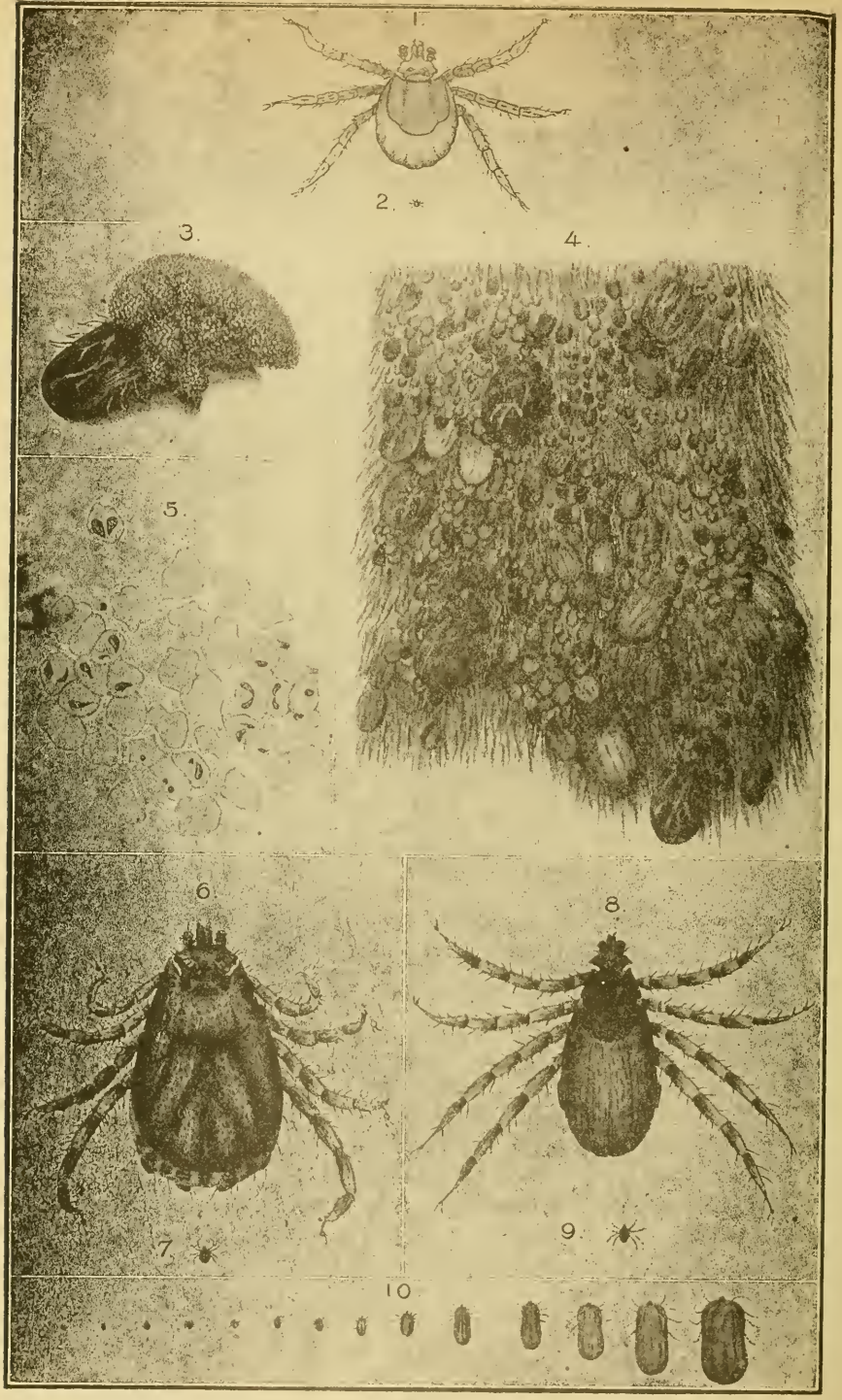


Fig. 2—Texas-fever protozoa and the ticks which transmit them
*1, larva of cattle tick (X25); 2, same (natural size); 3, mature female and eggs; 4, hide showing cattle ticks; 5, blood cells containing Texas-fever protozoa (X1,000); 6, male cattle tick (X15); 7, same (natural size); 8, young female cattle tick (X15); 9, same (natural size); 10, various stages of cattle ticks.

have been on the cattle about a week the tick sheds its body coat. After one more week the covering of the body is shed again and the tick is fully equipped with sexual organs and has grown very rapidly. In a few days the female fills her body with blood and drops to the ground laying from 2,000 to3,000 eggs after which she dies.

The only way Texas fever is transmitted under natural conditions is for the immature tick to attach itself to a cow. As far as is known mature ticks do not go from one cow to another neither will the body wastes of a sick cow impart the disease to a healthy cow. And again the tick itself does not cause the disease, but carries a very minute animal organism called a protozoa, measuring possibly one twelve thousandth of an inch in diameter. This organism throws off from its body a poisonous product which is responsible for the symptoms developed in the disease. This minute animal (protozoa) is responsible for breaking up the blood corpuscles which are thrown off with the body wastes of cattle during the disease but most people believe that breaking up of the red corpuscles does not cause the death of the cattle but death is caused by the poisonous products thrown off by these minute organisms. The protozoa enter the blood of the cattle when the tick sucks the blood.

This disease is peculiar to science in that healthy cattle from the south are capable of bringing the disease into a bunch of cattle while the southern cattle are uneffected. This is due to the fact that younger cattle often recover and are immune to the disease the remainder of their lives but may carry the ticks into free territory. This immunity has greatly reduced losses in the south. It is a very fatal disease to aged cattle. August and September are probably the months of the greatest losses.

SYMPTOMS

The effected animals have a tendency to isolate themselves from the herd. The appetite and flow of milk decreases, the fever is high, and the bowels are constipated but later become softer. The urine becomes deep red in color and the animal gets poor rapidly. The blood becomes watery and an incision in the skin often fails to make a flow of blood. After death, if the spleen is examined it will be found to be greatly enlarged. If an incision is made into the spleen it will be a blue grape or black color inside instead of a cherry red. The bile will be flakey and is a very dependable symptom after death.

The presence of ticks on the body is good evidence of Texas Fever.

Death may take place in three days or the animal may live as long as three weeks.

TREATMENT

Remove all the ticks from the cattle by use of a curry comb and hand picking, separating all animals not having ticks from the tick infected ones. These cattle should be kept a short distance apart for 7 or 8 days, after which the ones that have never developed any ticks may be turned in to a tick free pasture. In picking or currying the ticks, the belly, base of udder and tail should be given special attention. Picking must be done every other day till the first of November if cattle are in tick pastures.

Good results have been claimed by the use of 5 drams (5 teaspoonfuls) of quinine in ½ pint of water twice daily for each 1,000 pounds live weight. But generally speaking drug treatment of effected animals has not been very satisfactory.

In southern states the U. S. government has cleaned what was once tick infected territory until now it is free of ticks. The method used is described in bulletin No. 78 of U. S. Department of Agriculture. It goes into detail of how to rid pastures of ticks under various conditions.

HEMORRHAGIC SEPTICEMIA

(*Pasteuellosis*) (*Corn Stalk Disease*)

FORMERLY PROBABLY KNOWN AS

(*Contagious Pneumonia*) *or* (*Lung Fever*)

Hemorrhagic Septicemia first received attention by the American veterinarians about 1900. Before many years elapse there will be outbreaks in practically every community of the corn belt if the malady spreads as rapidly in the next few years as it has spread since 1900. It is to be hoped the farmer will be more familiar with this disease than he was with contagious abortion and thereby avoid serious loss.

Hemorrhagic Septicemia effects cattle, hogs, horses, chickens and sheep, but it is rare to find more than one class of farm animals effected on the same farm at the same time. That is, horses apparently do not take the disease readily from cattle. I have known of hogs eating the carcass of cattle that died of the disease without ill results where the farmer did not know the seriousness of the disease. However, I am not trying to establish that such is desirable practice. It should not be

tolerated in a community. The carcasses should either be deeply buried or burned, and if moved from where they die they should not be dragged over the ground as such tends to spread the disease.

The disease is more likely to occur in feeders that have had an entire change of condition as feed, water, and shelter. Cattle that have been in stock cars and yards also come in contact with the contagion. Again young cattle are more often purchased and it seems to effect cattle under three years more often than the mature cattle. However in one outbreak in 1919 a mature cow in fair flesh became a victim of the disease and died.

The shipping of cattle does not account for all outbreaks. I have come in contact with effected herds that have had no cattle brought into them that took the disease and losses occurred.

I have about formed the conclusion that this disease germ is in the air the same as pneumonia and the weakened animals take the disease while more thrifty animals are more able to resist it.

Most veterinarians hold that September to December are the most favorable months of the year for this disease, and many believe the so called corn stalk disease is really hemorrhagic septicemia, rather than corn stalk or forage poisoning. The outbreak in St. Clair County, Missouri, came in the late spring months of 1919.

The germs are supposed to gain entrance into the animal's body by the way of the organs of breathing, the digestive tract or wounds.

SYMPTOMS

Three forms of this disease are recognized.

I The form of localizing itself in the lungs and air pasages.

II The intestinal form.

III The skin form.

The last form I have never observed but the first and second form are quite frequent in all classes of farm animals.

It is not infrequent to find the lung and intestinal form in the same animal at the same time. As I have observed this disease the animal usually dies within twenty-four hours after serious symptoms develop, however, Friedberger and Frohner state that the animal may live as long as five days. Less than ten per cent of the effected animals that develop serious symptoms recover.

In the outbreaks which I have observed, quite a number of the animals in the herd develop a dry short cough, as though they had taken a

cold. Quite a per cent of such animals have a discharge of pus from the nostrils. However, all animals developing a cough do not develop hemorrhagic septicemia. The chief symptoms in the lung form are, loss of appetite, weakness, a dry short cough, breathing becomes more difficult as the case advances. High fever is usually present. With these symptoms may be mixed symptoms of the intestinal form.

After death, in the lung form, if the chest cavity is laid open by taking an ax and breaking the ribs and laying the breast bone back over the abdomen, a portion of the lungs will be found red and apparently blood colored. The red portion sinks readily in water while the balance of the lung will float in water.

From one to several gallons of water may be found in the chest cavity. In other words, the lung form terminates in pneumonia but usually the patient does not linger as long as in pneumonia.

The intestinal form has somewhat better defined symptoms. The animal goes off feed, becomes dull, may moan and have colicky pains, sit on the haunches as a dog, may champ the jaws, may go in circles, which has led some to believe the disease is sometimes centralized in the central nervous system. The fever may be high or absent. In cattle, a diarrhoea usually developes, but before death the bowels may become normal. In hogs in the bowel form they are often noticeably constipated In the chronic form of intestinal hemorrhagic septicemia the animal may linger several weeks and finally die of weakness or recover. I have observed young cattle and calves of effected herds that had all the nutritious feed they could eat and the best of care, that would remain thin, weak, and unthrifty for weeks after the first symptoms develop. Often bowell disorder or diarrohea would be present for a few days.

(The Skin Form)

In the skin form of hemorrhagic septicemia, swellings can be noticed on the dewlap under the throat and between the lower jaw bones. The tongue often swells to an enormous size. This form often terminates in the intestinal form, with the symptoms of that form.

After death, in the skin form, red inflamed patches may be found under the skin. Associated with the ruptured blood vessels may be found a gold colored jelly like serum. Portions of this matter may be found in the lungs when the lungs are effected.

TREATMENT

Separate the sick and well animals. It is my opinion that any one

purchasing stock cattle will do well, especially during the fall months to have them immuned to this disease before they are shipped.

There is a bacterin for hemorrhagic septicemia which is very successful in keeping unaffected animals from taking the disease. As a preventative or to immune well animals a 2 mil. (2 cubic centimeter) or approximately (two-fifths of a teaspoonful) of the bacterin is injected with a hypodermic syringe under the loose skin of the neck in mature cattle. A very convenient syringe for this purpose is shown on page 17, fig. 14. For effected animals a dose should be given every 48 hours till recovery and where the herd is in a weakened condition, the well animals should receive a second dose after 5 days.

This immunity apparently lasts for eight or nine months. These bacterins are for sale by drug houses listed in the last pages of this book or may be purchased from Biological houses as Parker Davis through the local druggist.

BLACK LEG

(Quarter Ill)

This is the most prevalent of all diseases in young cattle. It occurs in all parts of the United States, but is more frequently met with west of the Mississippi river and east of the Rocky mountains. Upon some farms, vaccination must be done every year to prevent the disease, while on adjoining farms black-leg has never been known. My experience has been that the disease is more prevalent in March, April, May, September, October, and November, but some writers give June, July and August as the months the disease is most prevalent.

The disease is caused by a germ which can be found in the passages of diseased animals, soil and water.

This germ (bacteria) is very hard to kill, since it goes into a spore or shell stage and resists disinfectants.

In the shell stage, it will live several years if unmolested which accounts for the appearance of the disease year after year on many farms.

It requires 1 pint of carboic acid to 1 gallon of water to kill the germs of this disease, 1-5000 of corrosive sublimate will effectively kill the germs of the disease.

Nearly every writer classes this as a non-contagious disease. That is to say, a healthy animal will not take the disease from a sick one. It is assumed to be an infectious disease. That is, the germ enters the body through cuts and abrasions of the skin, hollow tooth cavities, etc.

I know that if one animal of a herd gets black-leg, other of black-leg age are more than likely to take the disease in a few days, whether they have lost any teeth or not. I am of the opinion it will be an established fact some day that a well animal can develop the disease by being in contact with a sick animal. It may be by introduction of the body wastes of sick animals into the system or due to the breath. In my opinion this disease is as frequent on well drained soils as any other kind of soil.

SYMPTOMS

This disease seldom attacks calves under four months old or over two years old. The healthier and thriftier calves seem to be more susceptible to the disease than others. Loss of appetite, stupidness and fever are the first symptoms and usually pass unnoticed. The first noticeable symptoms is lameness, which may at first be mistaken for a sprain. In a few hours the lameness becomes noticeably worse and the animal lays down, bloats, breathing becomes difficult, followed by rigidity of the muscles, and saliva comes from the mouth. The muscles at first are tender and sensitive to pressure, but later on in the disease, an incision may be made into the skin with little pain to the beast.

Some writers speak of swollen patches above the knees and on the muscles of the legs, neck and shoulders. I have seen such swellings, but I would say they are rare.

When the skin is grasped in the hand, a crackling noise can be heard much like that when tissue paper is crushed in the hand. This is due to gas and dryness under the skin. After the animal dies many gas bubbles can be found under the skin, especially on the legs and neck. Death occurs in from 15 hours to 3 days after the first symptoms appear. Recovery is very rare in black leg. Hemorrhagic septicemia and black leg may be confused. Hemorrhagic septicemia effects cattle and calves and has no crackling sound as is found in black leg.

TREATMENT

Treatment of the effected animals is useless, however the well ones should be vaccinated, as a high per cent of them can be saved. On farms where black leg occurs, it is necessary to vaccinate at least once a year and preferably twice a year, since calves over six months are likely to take the disease. The U. S. Department of Agriculture will furnish dependable vaccine free of charge. A complete vaccinating outfit can

be obtained from Z. D. Gillman, Washington, D. C. Veterinary supply houses on the last pages of this book have outfits and vaccine for sale.

Black leg vaccine can be bought at nearly all drug stores if it must be obtained immediately. The sooner the well animals of an infected herd are vaccinated the more calves there will be saved.

TUBERCULOSIS

(Consumption of Cattle)

CAUSES AND GENERAL DISCUSSION

Tuberculosis effects practically all domestic animals, but cattle, hogs and poultry seem to be more susceptible to tuberculosis than other farm animals. The disease is caused by a bacteria about .00005905 of an inch wide and about .0001181 of an inch in length, which is about the average size of bacteria. Such a minute organism is visible only with a modern high powered microscope. Tuberculosis is very rare among cattle that range on the plains. Not that plain cattle are immune but its frequency increases in proportion to the amount the cattle are confined and housed. Therefore it is more frequent among dairy herds than beef herds. However, it does not follow that beef cattle are never effected, for when the tuberculin test is applied, a much higher per cent of beef cattle react than is generally supposed by the uninformed public. Some of the very best beef herds of the corn belt have been found to be rotten with tuberculosis.

One effected cow introduced into a healthy herd of confined cattle may infect a herd of either beef or dairy cattle, until as many as eighty per cent of the cattle will react to the tuberculin test.

Cattle effected with tuberculosis throw the germs out of the body with the expired air, bowel passages and when the udder is effected the tubercular bacteria are in the milk before it leaves the animal body.

About seventy-five per cent of the cattle reacting over which post mortems have been held have shown tuberculosis of the lungs. It is probable that the bacteria enter the animal's body more often with the inspired air than by any other course, although it is not necessarily so. When we consider that all organs of the body except the teeth have been found tubercular, it naturally follows that an effected organ is not necessarily the route by which the germs have entered the body.

A cow effected with tuberculosis of the lungs coughs chiefly at feeding and watering times, which is especially noticeable after exertion. If an effected animal happens to be in front of a healthy animal at feeding or watering time and the effected animal coughs the spray from her mouth into the nostrils of the healthy animal, the healthy animal has a good chance to become infected. In the same way it is possible for an infected animal to infect the water or feed of healthy animals. Where animals are closely confined, the spray may be carried by dust particles, since a dust particle is in size to bacteria as an aeroplane is to a man. About 50 per cent of the tubercular cattle have the disease in the intestinal canal. As inferred above, a tubercular animal may infect food by breathing or coughing, especially in close quarters. Infection does not occur so often in the open pastures for sunlight soon kills tubercular bacteria, but they will live many months out of sunlight. Many animals effected after they are killed show tuberculosis in more than one organ. That is, the same cow often has the lungs and intestines both effected, due probably to swallowing lung expectorate.

SYMPTOMS

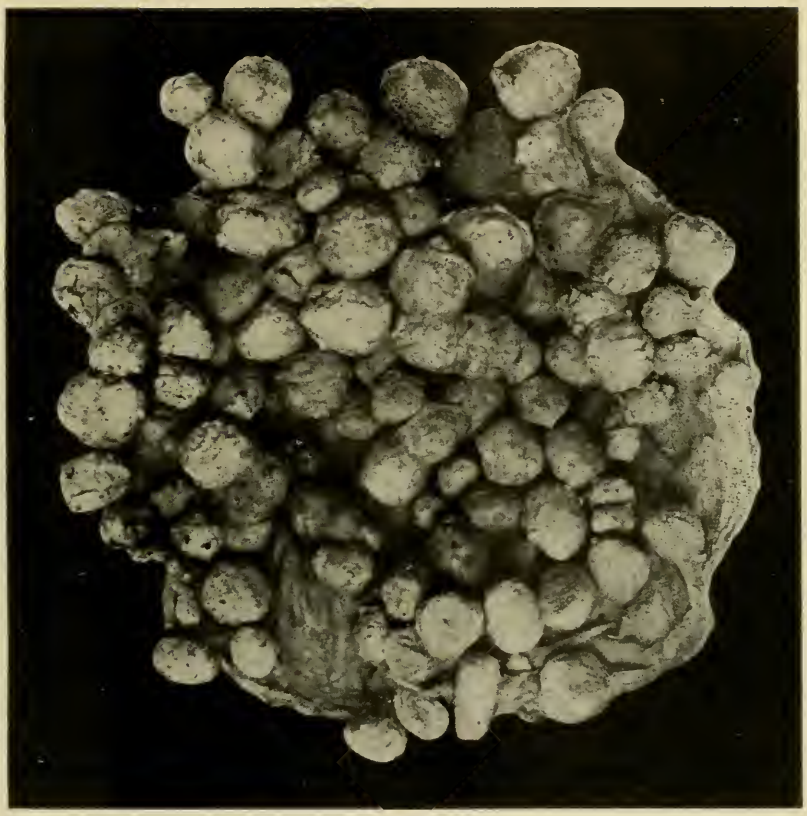
Tuberculosis takes a chronic course in cattle and symptoms do not develope till the disease is well advanced. Fully eighty-five per cent of the cattle that react to the tuberculin test have no symptoms of tuberlosis or any other disease, but after slaughter, the disease can be found in one or more organs of the body.

The lung form of tuberculosis is probably accompanied by more accurate symptoms than are found when any other organ is effected. A weak, slow, dull, dry cough at feeding and watering time is probably the most noticeable symptom. This cough is accompanied usually with one or more of the following symptoms. The hide is leather like, the hair stands erect, sunken eyes, and cows are usually hard to keep in condition, but the appetite is not lost till the very last stages of the disease.

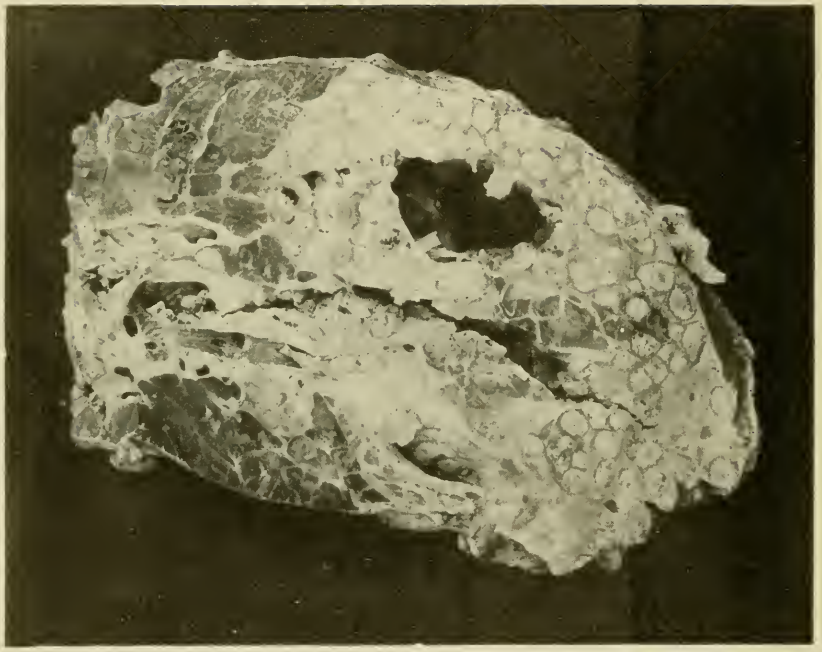
In the worst intestinal form, an incurable diarrohea or constipation developes in the last days of the disease.

The symptoms of other forms of tuberculosis are variable in the different organs, and I do not consider a discussion of the same would be of any advantage.

The tuberculin test for tuberculosis is very reliable and is the only certain way to diagnose the disease, provided the animals are stabled



Tuberculosis of the omentum or caul. The picture shows another form of "pearl disease," in which each nodule is about the size of a grape and is composed of a large number of smaller nodules which have grown together.



Section of a tuberculous lung from a cow. The picture shows numerous nearly round tuberculous nodules, one large tuberculous cavity, and several air tubes that extend from tuberculous nodules that are softening and breaking down. When tuberculous nodules in the lungs break down the material of which they are composed, and which contains millions of tuberculosis germs is coughed up. Some of the germs are sprayed from the mouth and others are swallowed and discharged with the dung.

and have become used to the surroundings. However, if an animal is excited while making the tuberculin test, the excitement may cause a rise in the temperature, thereby making the animal appear tuberculin. On the other hand, very severe cases will not always react, but usually sufficient symptoms can be seen to warrant an inspection of the lungs, udder, bladder, etc. Most any one can make the test accurately.

I Take the temperature of each animal according to their No's. at least three times at intervals of three hours before any tubtrculin is injected. This is done to get the normal temperature of the cow by the way of the rectum.

II Wash the skin at the point where the tuberculin is to be injected with dip water before the injection. Inject the tuberculin with a hollow needle syringe in the loose skin of the neck. Make the injection at 8 p. m.

III Record the temperature of all cattle nine hours after the injection is made and every 3 hours for 16 hours after the injection is made.

IV If the temperature does not rise within 16 hours after the injection, the cow may be turned loose. However, if the temperature shows an upward tendency continue to take the temperature until the rise ceases.

V If the temperature rises before the sixteenth hour the taking of the temperature should be continued till a fall of temperature begins.

VI A sudden change of temperature surrounding the cattle will make an inacurate test.

VII The test is not reliable if a cow is in febrile condition.

VIII Cows that are far advanced in pregnancy or that have just calved do not give a reliable test.

IX Calves under six months should not be tested.

X If retests are made, or in old emaciated animals, twice the regular dose should be used.

XI Cattle proving tuberculin, that is if the temperature rises more than 2 degrees over the highest temperature taken before the tuberculin was injected, should be kept away from healthy cattle, and marked tuberculin. Cloudy tuberculin is unreliable.

The temperature in the majority of cases rises between the 6th and 12th hour after the injection.

Cattle that have tuberculosis in the worst form do not show a very

decided rise in temperature. Healthy animals show no reaction at all or at most a very slight reaction. No animal with a normal temperature of over 103 is fit to test for tuberculosis.

Prevention of Tuberculosis

Under ordinary conditions a course of treatment is not advisable because of the danger of spreading the disease to other stock. Out door life night and day with an open shed for shelter is probably the most effective treatment.

All calves using milk of tuberculosis cows should have their milk boiled, and such milk should not be used for family use.

Barns where tuberculosis cattle have been should be thoroughly cleaned after the cattle are removed and all parts of the building washed with 1 gallon of formaldehyde to twenty of water. New cattle should not be purchased unless they have had the tuberculin test and passed. If more people required it there would soon be a great reduction in tuberculosis.

Facts About Tuberculosis

I One seventh of the human deaths are due to tuberculosis.

II That scientific men have made sufficient study of the relation of bovine and human tuberculosis to draw an accurate conclusion.

III Out of authentic tests, east of the Missouri river, covering 15 years, approximately 10 per cent of the number of cattle tested have proven tubercular.

IV That bovine or the kind of tuberculosis effecting cattle is fatal quite often to children, fed cows' milk.

V There are constant opportunities of transmitting tuberculosis to children.

VI The germs are in the air of the buildings housing tuberculin cows and often get in clean cows milk.

VII Investigations have shown that about two tuberculin cows out of nine pass the germs in the milk as it is drawn from the udder.

Relation of Bovine Tuberculosis to the Human Family

Dr. Park of the New York City board of health has probably made a more extensive study of the relation of bovine tuberculosis to the human family than any one else in the United States. His years of study are briefly summarized as follows.

15 cases of tuberculosis out of 955 cases of tuberculosis in adults

examined proved to be of bovine origin.

In children between 5 and 16 years old, bovine infections were found in 46 instances out of 177 cases examined. Out of 252 cases under 5 years of age, 201 were infected with human tuberculosis and 51 with the bovine type of infection, or approximately 20 per cent of the deaths showed bovine infection.

According to Dr. Park's investigation as well as the investigations of many other scientific men prove that bovine tuberculosis is not of as much importance as the human type of tuberculosis to man still it is no negligible matter. I can see no difference between poisoning a child with such disease germs that can soley be prevented by the tuberculin test and sanitation than using any other method of careless destruction. Then it becomes of interest to know how infection gets into the milk, the most wholesome food known when it is pure, but when it is impure the most deplorable source of contamination known.

I By the cow passing the germs in the milk as it is drawn from the udder.

II By germs being in the air of a barn, housing tubercular cows.

By particles of soil or manure, and it makes no difference how small that particle or particles may be, if it falls from the udder, teats, flank or tail into the milk pail, it may be carried by the milk to the child. These particles get the tubercular germs in the barn or lots by the cough of an infected cow, or by being soiled by bowel passages.

In my opinion, the last two methods are the most frequent sources of infection. Such contamination of milk is disagreeable to think about but nevertheless is of too much importance to be ignored.

Human Tuberculosis and the Public

In my opinion, the public is not sufficiently concerned about the subject of tuberculosis. When the world knocked at our door for a toll of the young manhood, a cloud of grief hung over our land. The 50,000 lives which it cost us were, to say the least, spent in a cause which no man could apparently prevent, yet the loss of life was deplorable to think about. But 150,000 lives are lost annually in the United States by tuberculosis, and a large number of such deaths could be prevented by understanding how the disease goes from individual to individual. If an enemy was to kill off indiscriminately that many young babes, young people, etc., we would spend millions to conquer them, but when its tuberculosis, the public is not sufficiently interested.

When men become as interested to know how tuberculosis kills people as modern methods of warfare, then the enemy will soon be conquered, in the human family. We are spending some money to control the disease among cattle, but as yet we have not taken active steps to control the disease among people.

The following facts are of interest in the control of human tuberculosis.

a One seventh of the deaths in the United States are due to tuberculosis.

b The germs have been known to live 7 months outside of man's body.

c Liquids containing tuberculosis must be boiled 3 minutes to kill the germs.

d Sunlight is effective to aid in killing germs in the home or barn.

e The air surrounding a consumptive patient is filled with germs.

f The knives, forks, drinking utensils, etc., and in fact anything coming in contact with portions of the body or garments of a consumptive often becomes contaminated and may carry germs to a well person.

g A consumptive cough and sputum carries germs by the thousands and they should cough in a rag as well as spit in one and the same should be burned.

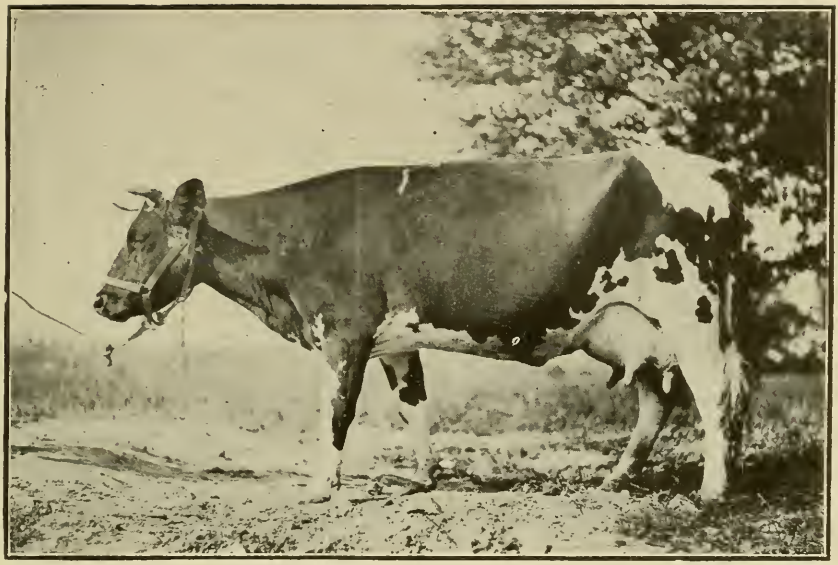
h Many people are prone to believe the above preventions are foolish, not knowing that a child living with a consumptive parent may take the disease into the lungs or intestines and not show marked symptoms for years, yet the disease is slowly progressing and before long the young man or lady is attacked with tuberculosis and all wonder where it came from and if it is inherited. See if there isn't a record of such a case in your community and take warning.

i There is a tubercular home provided in most states where the best of treatment is provided and some cases cured. This is the place for persons suffering from tuberculosis, where they cannot give the disease to others.

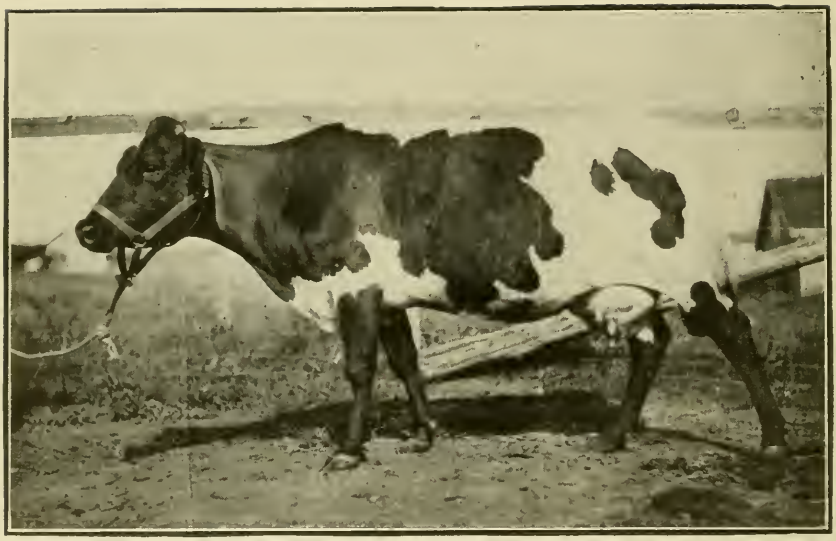
MILK FEVER

(Parturiation Fever) *(Parturient Paresis)*

This disease is peculiar to cows bred to yield a large capacity of milk. It most often occurs within forty-eight hours after the calf is



An apparently healthy cow affected with tuberculosis. She does not cough, her appetite is good, she seems strong and vigorous, and gives an unusually large quantity of milk. At the time the picture was taken it was known that she had been tuberculous at least four years and that she had been passing large numbers of tuberculosis germs from her body at least three years. Since it first became known that the cow was diseased she has given birth to four calves.



A cow affected with long-standing, advanced tuberculosis, with large tuberculous swellings in the udder. A year before the picture was taken the cow was discovered to have udder tuberculosis. This discovery was made by injecting some of her milk into guinea pigs; there was nothing in the appearance or external condition of the udder at first to show that it was diseased. How very dangerous such cows are may be judged from the fact that calves that are permitted to drink milk from tuberculous udders only a single time are almost certain to have tuberculosis. A small amount of milk from cows like those in the above picture and in figure 4 mixed with the milk of other cows will make the whole of it dangerous for both persons and lower animals.

born. Cases have been known to develop immediately before calving, and several weeks after calving, however such cases are rare. Milk fever is never seen in heifers and is rarely seen in aged cows. Cows having a large digestive capacity and three to seven years old and receiving an abundance of food are the ones most often attacked. Quick and easy birth of the calf are favorable to the development of milk fever.

Milk fever is more likely to occur in a warm stable or in the summer time especially after an electrical storm. One attack of milk fever does not make a cow immune to following attacks. The exact cause of milk fever is not known. Some believe the disease is due to a poison developed in the udder by bacteria. Some believe the symptoms are due to poison developing in the uterus.

SYMPTOMS

Milk fever is a very easy disease to distinguish, since there is no similar disease following easy calving. Occasionally it may require three or four days for the symptoms to fully develop, but the symptoms usually fully develop within 30 hours. The cow shows unmistakeable signs of paralysis, particularly in the organs of locomotion, bowels and kidneys. That is, the cow reels, staggers and may even fall to the ground. Passages do not come from the bowels or kidneys, and the cow bloats. The head is swung around to the side or stretched out flat on the ground. In some cases, a sticky discharge comes from the nostrils. The eyes are dull and blurred. The animal may become entirely insensible. The cow persists in keeping the head turned around to the side when she is down. Colicky pains and nervousness are often evidenced.

TREATMENT

To reduce the feed prior to and for a few days after calving in heavy milkers aids in preventing the disease. Calving in cool places may aid in the prevention of milk fever.

The treatment for milk fever consists in keeping the udder tightly inflated with sterile air till recovery takes place. Milk fever outfits consisting of an air pump rubber tube and teat tube and may be bought of veterinary supply houses or mail order houses. For such an outfit to be safe to use, it should have a place for surgical cotton in it. That is, air contains bacteria and these must be filtered out or reduced in number by pumping the air that goes into the quarters of the udder through sterile

cotton. 10 to 15 drops of camphor and 1-3 as much ether should be placed on the cotton in the pump before any air is pumped into the udder. Treatment by inflating the udder with air is dangerous unless the hands of the operator are absolutely clean. The milk fever outfit must be boiled for 20 minutes before it is used and carried to the cow in a previously boiled towel. When the cow is reached, one man should wash the teats and udder with soap water and dry them. The man with the clean hands should unwrap the milk fever outfit and insert the teat tube in a teat and fill the quarters with air till it is good and firm, filling one quarter at a time. I do not favor drawing the milk from the udder before filling the udder with air.

If the teats do not retain the inflated air they may be tied with a muslin bandage so the air cannot escape. Relief should take place if the treatment is properly given, in less than one hour. If relief is not attained, the udder should be inflated with air. If the proper sterilization and cleanliness is not followed as above outlined, infection may get into the udder and one or more quarters be lost. In cases the infection or germs of the air may kill the cow.

Ninety to ninety-five per cent of the cases should recover if properly treated. The cow seldom lives longer than three days if treatment is not given. A pound of epsom salts and 2 to 3 drams of creolin may be given as a drench to loosen up the bowels and act as an antiseptic to the bowels or 15 grains 1-5 - 1-4 of a teaspoonful of barium chloride, 15 grains, 1-5 - 1-4 teaspoonful of tartar emetic may be given.

The above is a good laxative dose given in a capsule for a cow that has recovered from milk fever to avoid constipation. Such drugs should be given once as soon as the cow gets up and repeated in 12 hours.

No milk should be drawn from a cow that recovers under 24 hours and only small amounts should be drawn for 4 or 5 days. To keep the the udder full seems to ward off another attack or back set.

PILES

(Prolapse of the Rectum)

Piles is not a very common disease among cattle. It is usually caused by straining or a course, dry, and irritant feed.

TREATMENT

Feed a laxative diet as oil meal, bran, alfalfa or clover hay. In

the larger cattle, one or two pints of raw linseed oil is very beneficial. It not only prevents straining when the bowels move but helps to keep the stiches from tearing out. It is best to postpone treatment until the laxitaves have acted if practical. However in some cases treatment cannot be postponed. The best treatment for piles in cattle is to gently wash the protruding parts of the rectum with alum water and soap, dry with a towel and sprinkle it over with sugar, gently press the parts back into the body cavity. Have on hand a cobbler's sewing thread doubled several times and well waxed and threaded in a needle dipped in a strong solution of dip or carbolic acid. A stich is to be taken across the anus sewing the lips of the same together. Do not draw the stiches tight enough to interfere with the bowel passages. After 4 or 5 days the rectum usually stays in place if the cow is fed a laxative diet. This operation is quicker and safer than surgery.

MANGE

(Scabies of Cattle)

This is quite similar to sheep scab but the two are not the same. It is not as prevalent as sheep scab. It is caused by a minute organism (mite) that can be seen on the effected animals by the aid of a hand reading glass. The mite in appearance resembles a spider. It effects chiefly middle aged cattle.

SYMPTOMS

This mite bothers the herds in cold weather causing the hair to come off and the animals may rub the effected parts so severely that bleeding or tearing of the skin occurs. The hair comes off of the animals at the time it is most needed. The skin of the neck and shoulders becomes wrinkled.

TREATMENT

Make a lime sulphur dip as recommended for sheep scab and apply it liberally with a brush or cloth. The state veterinarian and his deputies are paid by the people to render assistance in this disease. This service will be beneficial.

PINK EYE

(Infectious Opthalmia)

There is more or less pink eye throughout the country each year. The infection of this disease is, beyond a doubt, carried by flies, hence

the difficulty of eliminating it from a herd until the fly season is over. Flies carry the disease from neighboring herds or newly introduced effected animals. The eyes water matter and often turn blue. Sometimes effected animals lose the sight of the eye.

TREATMENT

While this disease cannot be eliminated it can be controlled in severity, by using boric acid water. Take 3 level teaspoonfuls of boric acid, moisten with water and work to a moist dough with the fingers, add enough water to make one pint. Rope the effected animals to a post and gently syringe out the effected eyes each morning. If done in the morning, it wards off the attack and irritation of flies. By syringing in the mornings the full effect of the medicine is in force during the light of the day and has a soothing effect. My experience with pink eye has led me to believe that boric acid water makes the disease less severe and hastens its termination.

BLUE MILK

Blue milk may be caused by a stagnant water supply, dark housing of the cows or warm and moist weather. It is more often caused by a germ that harbors in the teats.

TREATMENT

If it is due to water or housing, the conditions should be changed. If it is due to bacteria, take a small, blunt pointed syringe and inject in the effected teats a few syringe fulls of a solution made by mixing 2 drams of sodium hyposulphate in one pint of water.

This may or may not be noticeable at milking time. When it can be detected in a cow as she is milked it is probably a local infection that can be overcome by applying camphor and lard, equal parts. See (Inflammation of the Udder.) Massage the udder with the hands. Hot and cold cloths and liniments, or Venice Turpentine, may aid in reducing the swelling.

Then there's another kind of stringy milk that is not noticeable at the time the milk is drawn but develops after the milk has set a few hours. This may be due to moldy feed or weeds cattle eat in the field or the water supply. Secure a sample of milk from a neighbor, place some of the water of the effected cattle in it and see if it becomes stringy.

in a few hours. Salt may be beneficial if given to cattle, giving stringy milk.

INFLAMMATION OF THE UDDER

(*Garget*) (*Infectious Mastitis*)

This is caused by bacteria that thrive in filth as filthy stables and mud holes. The infection may enter through a wound in the udder or through the openings of the teats. Tuberculosis sometimes causes hardening of the udder but develops slower than garget.

SYMPTOMS

The cow may lose the power of milk secretion or watery milk may be given from one or more quarters. The udder becomes inflamed or swollen and feverish and the teats become very sore. The condition usually improves if proper attention is given it. If proper attention is not given, fibrous tissue may form and leave a caked udder, or pus may continue to form in some cases and a portion of the udder may rot away or blood poison may develop and death follow.

TREATMENT

Rub equal parts of lard and camphor on the affected part three times daily. Hot and cold cloths applied alternately and hand massaging often helps to stimulate blood circulation to the effected part. An antiphlogistine pack supported in place aids in scattering the poisonous pus. Keep the udder empty by milking.

The sore teats may be healed by an ointment made of

14 parts lard, vaseline or cocoa butter

2 parts camphor

1 part turpentine

Rub the above on the teats twice daily.

SPRAINS, BRUISES AND LOCAL INFLAMMATION

(*Swelling*)

Sprains of the ankles, swellings from bruises, etc., occasionally occur in cattle. When such inflammation occurs the effected part should be massaged by hand rubbing two or three times daily and have a mild

lineament or Spanish fly blister, 1 part Spanish fly to 5 or 6 parts of lard applied two or three times at intervals of 15 or 20 hours.

Nothing can be done that is any better than to rub the part well. Apply hot cloths out of boiling water allowed to cool and app'y as hot as the animal will stand it, increasing the heat every time the cloth is renewed. 15 or 20 minutes of such bathing should be given. Then apply a very mild plaster of Spanish fly 1 part, lard 6 or 7 parts and wrap the wound up in a c'ose fitting, (not tight) cotton bandage. Any of the above induce the blood to come to the effected joints to equalize body temperature and the excess of blood aids in carrying away the poisons or (inflammation.)

In rheumatism, a milder blister is preferable, while in sprains, etc., we usually prefer a stronger blister and treatment not repeated so often.

Hot fomentations or rubbing intensifies or makes the effects of the blister stronger.

DEHORNING

Some people prefer to dehorn their cattle when they are calves, others prefer to dehorn when they are six months older.

THE DRUG METHOD

Stick caustic potash may be used quite successfully if the calf is not over three days old. The calf should be laid on its side, the hair clipped over the horns and with a stick of caustic potash previously dipped in water, rub the site of the horn for ten seconds. Then apply the dampened potash to the other horn for 10 seconds. Then apply again to the first horn treated and then again to the second horn treated. Smear vaseline where it is not desired to have the drug remove the hair

THE CUTTER METHOD

Secure the calf and with a special instrument made especially for dehorning calves before they are three days old ca'led a dehorning cutter which fits right down to the base of the horn. With this instrument practically all the horn can be removed quite successfully. Tincture of iodine should be painted on the wound after this operation.

THE SAW AND CUTTER METHOD

These methods are used after the calf has become several months old. First clip the hair around the base of the horn as close to the head

as possible. Then wash with a solution of iodine water, 1 ounce (2 tablespoonfuls) of the iodine to ½ gallon of water. To clip the hair enables the operator to see better where he is sawing and to wash the clipped head according to my experience, eliminates the pus cases. In other words there should be no horns run pus if the clipping and washing is properly done and nothing but a clean saw or clippers are used. Good results cannot be expected if the saw is thrown down in the dirt after each horn is removed.

The horn should have a narrow ring of hair entirely encircling the base after it is removed. A close wound not only heals quicker but there is less likelyhood of the reappearance of the horns. Apply iodine water to the wound after the horn is removed.

RHEUMATISM

(Inflammation of the Muscles and Joints)

Rheumatism may assume an acute or a chronic course. In the acute form, the pain may shift from joint to joint. It is not always possible to tell whether the disease is one of the muscles or of the joints. When the joints are effected it is sometimes called articular rheumatism. The muscles of the hips, shoulders, loins, abdomen and jaws are the ones most often effected. Animals that have had the disease are more likely to develop the disease again. Generalized rheumatism often ends in death. Animals that recover are often stiff in the limbs.

CAUSES

The exact cause of rheumatism is not well established.

One of the most recent theories is that rheumatism of the joints is an infectious disease. That it is caused by disease producing bacteria which enter the body and get into the blood causing the pain by the poisons which they give off.

Some believe rheumatism is caused by the accumulation of acid in the blood. Others believe the disease is caused by strains, etc.

While the exact and specific causes are unknown, there are some factors inducive to the disease upon which most authorities agree. Among these factors are damp, cold quarters, allowing animals to cool off rapidly after severe exertion, etc. An animal that has been fed lots of feed and pampered and is suddenly changed to a light diet and exposure is a good subject for the disease. To a limited degree rheumatism seems

to be heredatary.

SYMPTOMS

As this disease is both acute and chronic, the symptoms may come on very rapid or may be slow in developing. Occasionally acute symptoms as colicky pains appear in the chronic form of the disease. The joint form of rheumatism is usual y acute while the muscular form is more often chronic. The joint or muscular form of the disease may shift from one muscle or joint to another joint or muscle, or it may be apparently firmly well seated in the hips or loins or elsewhere.

In the acute form, hot painful swellings generally develop at the base of the trouble, however, such swellings are not always present.

The muscles of the hips, shoulders, loins, jaws and abdomen are the ones most frequently effected.

Stiffness soon manifests itself and in rare cases the symptoms of brain trouble as cerebro spinal meningitis develop.

TREATMENT

Keep the animal comfortable and avoid change of stable temperature. Give the effected cow plenty of straw bedding, water and laxative feeds as oats, bran, clover hay, oil meal, etc., as there is a tendency for rheumatic animals to become constipated, especially if the muscles of the abdomen are effected. In severe constipation ½ to 1 lb. of salts may be given depending on the size of the animal, and the severity of the constipation.

Where the joints or loins are swollen they should be treated as indicated under the treatment for sprains and inflamation, page 129. No medical treatment is superior.

MEDICAL TREATMENT

Salicylate of soda, 1 ounce (2 tablespoonfuls), three times daily in one pint of luke warm water gives good results in chronic rheumatism.

Friedberger & Frohner recommend muscular injection of veratrine in ¾ to 1½ grain doses in 15 to 30 drops of rectified spirits daily for 4 or 5 days and then omitting a day. The dose should start with ¾ of a grain for 1200 pounds live weight and be increased 1-6 grain each dose following, but should never exceed 1½ grains per dose. The injections are made into the muscles of the shoulder with a hypodermic needle

syringe. If too much of the drug is being used the animal will sweat profusely, try to vomit, flow saliva, indicate severe pain and have symptoms of choking and spasms may be indicated. 1 ounce (2 tablespoonfuls) of 10 per cent solution of ammonia or three or four pints of coffee are the antidotes for poisoning, but if directions above are followed and the animal is exercised for a while after each injection poisoning is not likely to occur in a severe form. However, mild symptoms of excitement may develop occasionally after giving veratrine.

LICE INFECTED CATTLE

Lice may cause an unthrifty condition in cattle, however death due soley to lice is not unknown. I am of the opinion that the loss in gains and loss by death from lice is larger than most people think. This is especially true among cattle under one year old.

There are blue and red lice that effect cattle. The blue lice are more frequently met with than the red ones. The blue lice sucks the blood while the red lice bite. Lice are found in the greatest numbers on the muzzle, head, neck, shoulders and along the spine. Lice are more often met with when the cattle are kept in barns a large portion of the time.

TREATMENT

In cold weather when dips can not be used a large number of the parasites can be killed by brushing the calfs head, neck, shoulders and spine with equal parts of lard and coal oil. In warm weather, one gallon of dip to 25 or 30 gallon of water should be sprinkled over the entire body till all parts are moist with the solution. Since lice lay eggs it is necessary to repeat the treatment in ten days to kill the lice that hatch after the first treatment.

FLY BLOW. MAGGOTS

The blow fly often deposits its eggs in open wounds of the flesh, and in a very few days these eggs develop into a larvæ which feeds upon the flesh of the open wound eating and growing very rapidly. Such wounds are not always easy to heal if the maggots have been in it for several days.

TREATMENT

Generally in such flesh wounds the maggots can all be removed with the hand or by the use of a shaving which is the most practical method to pursue. To find an antiseptic or drug that will destroy the maggot and not injure the wound is not as easy as some people think. Maggots will live from 10 to 18 hours in a 1-1000 solution of corrosive sublimate or bichloride of mercury solution.

It requires several hours for maggots to die in a solution of equal parts of raw oil and gasoline.

Carbolic acid and turpentine can not be used on open flesh wounds sufficiently strong to kill the maggots in a reasonable length of time without injury to the wound. Pure gasoline will kill maggots placed in it in from three to ten minutes and will not injure wounds and may be used freely. It is the most efficient treatment in deep flesh wounds where all the maggots can not be seen. In such cases the wounds should have pure pine tar to which two teaspoonfuls of creolin have been added to each one third pint, applied to it every day to keep away the flies. Pure turpentine may be used in the horns of cattle.

HOG DEPARTMENT

HOG CHOLERA

(*Swine Fever*)

Improperly Called (*Mixed Infection*) (*Swine Plague*)

(*Hemorrhagic Septicemia*), (*Pneumonia*)

Hog cholera is a very contagious disease. No breed of hogs are immune or refuse to take the disease. The annual average loss from cholera alone is about $50,000,000 dollars. I believe that at least 75 per cent of such losses can be prevented, and I think that a majority of experiment station men will agree.

To date, the bacteriologists have not been able to isolate one or more organisms (bacteria) and prove that they are the cause of hog cholera. Until some one proves it other-wise and for all practical purposes it can well be considered to be a bacterial disease capable of exceptionally rapid multiplication in the hog's body.

SYMPTOMS

Hog cholera is more prevalent during the late summer and the fall months. There is no disease of hogs in the corn belt carried from farm to farm that kills off hogs like hog cholera. At this very time some writers of veterinary literature have a great deal to say about hemorrhagic septicemia, mixed infection, pneumonia, swine plague, influenza and other diseases of swine leading one to believe such diseases are of as much importance as hog cholera.

If the raisers of hogs or the veterinarian is led to believe such diseases are of importance they will become confused and not only be trying to establish a new swine disease for his community, (which is the stumbling block of both veterinarians and farmers) but a great deal of valuable time will be lost while the hogs continue to die. When these

new diseases become of sufficient importance that attention should be given to them, I have no doubt the experiment station and the U. S. Dep't. of Agriculture will call the farmer's attention to them. When hogs are dying in a community in numbers with symptoms of hog cholera and the lesions of cholera are found on the various organs after death, the thing for the farmer to immediately get interested in is a good anti hog cholera serum used in liberal doses. There are many concerns making serum and because you have immuned your hogs and they continue to die do not be too easily led into believing that you have some other disease than hog cholera. However there are rare cases where hemorrhagic septicemia follows cholera, especially where the quarters are dusty or the weather is wet. Then hemorrhagic septicemia bacterin for swine should be used. See cattle department for the description of this malady.

There are a multitude of products on the market to prevent hog cholera. No attention should be given to such products or those supposed to prevent or cure diseases supposed to closely resemble hog cholera, when thrifty hogs are dying as they do in hog cholera. To date, most experiment stations and the U. S. Dep't. of Agriculture have not found such diseases and products of sufficient importance to deserve particular attention.

Cholera may assume an acute or chronic form. That is to say, the hogs may die soon after they take ill or linger for several days. The symptoms do not differ in the two forms except in the length of time the hog lives after it takes sick.

Hog cholera usually develops in from 4 to 18 days after the germ enters the hogs body. Because you do not find from three to six dead hogs every morning that showed no sickness the previous night, do not form the conclusion you haven't got hog cholera. The hogs may drop off several days apart with hog cholera. The disease usually appears in the acute form but may run into a chronic form in a community and remain in that form in a community for several months. The germ seems to weaken as it passes through several generations. When a disease first appears in a community, the hogs seem to have pretty generally the same symptoms, but after the disease has been at work for some time no two hogs of the same herd may have the same symptoms. The symptoms presented depends upon the organs effected. If the intestinal canal or any other one organ is the seat of the disease, you have intes-

tinal symptoms of the particular organ effected. If two or several organs are effected the symptoms may be mixed with any one or several of the following symptoms.

The body temperature indicates the presence of fever. The pigs appetite is reduced or entirely suppressed. He may eat dirt or indigestible food in preference to good food. The bowels are often constipated at the beginning of the disease. Blood or mucous may be passed with the hard lumps. The constipation later runs into an offensive smelling diarrhea. Pigs with cholera often bury the head or the entire body in the bedding and if made to get up they have a tucked up appearance and sometimes a peculiar characteristic hacking cough which may be accompanied by labored breathing due to the lungs effected with lung worm or hog cholera. The gait often shows weakness and wabbling in the hind legs probably due to effected kidneys. A pussy, sticky, gummy discharge may come from the eyes and nose. The skin on the under part of the belly, inside of the thighs, snout, or around the ears is often reddish blue or purple due to cholera.

A hog may have cholera and a very limited number of these symptoms be present. The ones present might be symptoms of some other disease, so it is more dependable to determine by the conditions found immediately after killing a sick hog or death. The conditions found after death are not as easily confused with other diseases as the symptoms before death.

Examination of the Carcass After Death (Post Mortem Condition)

First of all, look for the red, bluish or purple discoloration on the belly, inside of the thighs, on snout or about the base of the ears.

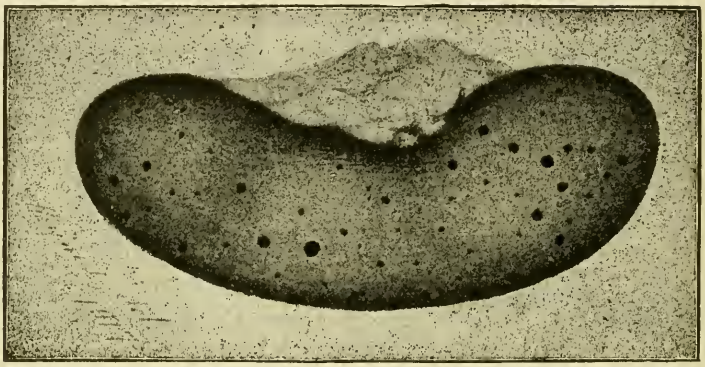
Examine the entire body for cuts, bruises, etc. which might have caused the death by lock jaw, etc.

The conditions after death are not the same in all hogs. Some may have only one organ effected while others have several organs that show lesions of hog cholera. Due to this fact, a thorough examination is necessary.

The conditions found on the internal organs are either those of bursted blood vessels or ulcerations. The lymph glands which are exposed when the throat is cut cross wise may be specked showing ruptured blood vessels. They may be swollen and red, or even a bluish black color. Any body glands are subject to such conditions. The glands are more often effected in cases of short duration.

In cholera the lungs are often effected, especially in the winter they show inflammation and more or less pus is discharged from the nose, accompanied by labored breathing.

The kidneys become speckled much like the brownish specks on a turkey's egg. The outer surface of the stomach and inner surface of the bladder may become reddened and inflamed.



Kidney of cholera hog showing brownish specks, similar to the brownish specks on a turkey egg.

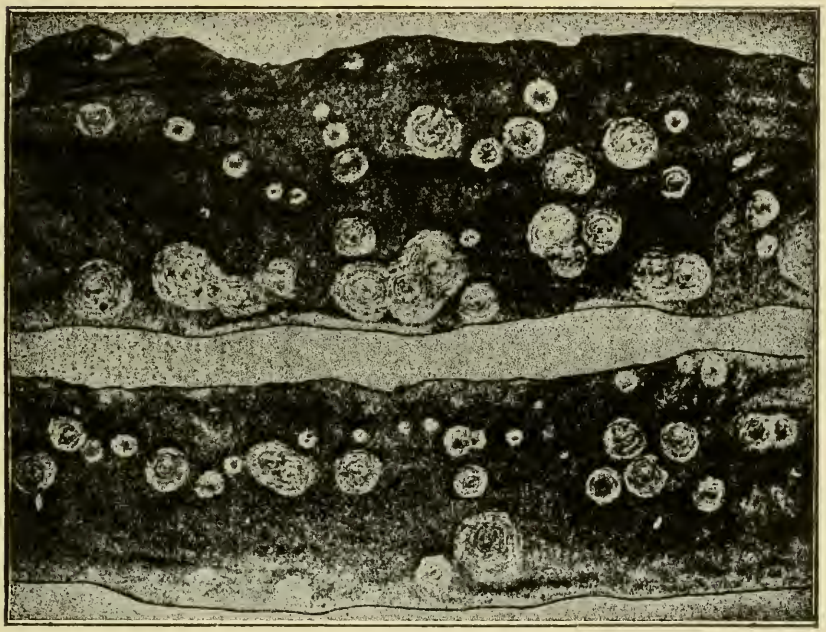
The inside of the small intestine and the blind gut often have flat or oval ulcers on them from the size of a pin head to that of a quarter of a dollar. To find intestinal ulcers is almost infallible proof of hog cholera. Inflammation of the intestines might be due to cockle burr poisoning or from worms. Either can be detected by finding them.

PREVENTION

I made the statement in a previous paragraph that most of the fifty million dollar loss which farmers lose as an annual average from hog cholera can largely be prevented.

As far as is known, the organisms causing hog cholera do not develop or grow anywhere in nature except in the body of swine. These organisms, germs, virus, or whatever you choose to call them are thrown off the body of the sick hogs with the bowel and kidney passages. From all that has been learned, hundreds of them must be thrown out with each passage from a sick hog. It seems to be almost impossible for a person to walk through a cholera lot and enter a well pen immediately af-

ter without carrying the germs to the well hogs. In other words, it seems the very smallest dust or soil particles coming from a diseased pen is sufficient to give the disease to a whole herd of healthy hogs. That is to say, if you can keep particles that have been soiled in any way by sick hogs, from coming in contact with well hogs you will never get hog cholera, provided crows, dogs, water, etc. do not carry portions of dead hogs to your farm. To be more specific, my observation and reading has led me to believe that nearly ninety per cent of the hog cholera is carried



Ulcerations of the intestines of a hog that has died with cholera.

to well hogs by human beings, and in a large per cent of the cases the owner himself carries the disease to his own herd. I will name a few of the ways in which he carries the disease.

The owner hears of a neighbor who has a peculiar disease among his hogs and some people think it is cholera. Mr. A. goes right over to see Mr. B.s sick hogs and invariably goes just before chore time. Mr. A. finds Mr. B. out with his sick hogs and ideas are exchanged for a

half an hour or so. Mr. A. gets some of the manure on his shoes out of the sick pen, goes home, gets in his corn crib, walks on the corn and then throws the corn out to the hogs. Mr. A. looks his hogs over and all of them report for feed in a healthy condition. But in 4 to 14 days, Mr. A.s hogs take sick and he wonders where they got the disease. Now he went over to see Mr. B.s hogs expressly to see how those hogs acted so if his hogs got sick, he'd know how they acted. In other words the trip to the sick pens was unnecessary. Friendly visits may carry hog cholera from a sick pen to a well herd in the same way. A stock buyer may carry it from the city stock yards. It is often carried from railroad stock yards where farmers are unloading exposed hogs back to farms that harbor well hogs. You haul off hogs for a neighbor, unload them and tramp around in the urine or the bowel passages of sick hogs, jump in your wagon, tramp in it and go straight home, tramp over your corn you feed your hogs or haul the corn out in your wagon you got into at the infected yards and scoop the corn, infection and all out to your hogs. You may haul exposed hogs for a neighbor without giving the disease to your hogs if you take the following precautions. I Bed your wagon heavy. II When you arrive home kick the bedding out in an isolated spot where no hogs are kept and burn all bedding. III Don't take your wagon in your lot or go in it yourself till you have taken care of the bedding, washed your wagon bed inside and out, hounds, coupling poles, wheels, break rubbers, double trees, your own shoes and anything that might carry the smallest dirt particle with a 10 per cent dip solution. Scrub the whole business with a broom. A ten per cent solution is ½ gallon of dip to 5 gallon of water. Then cover all parts of the bed, tongue, double trees, wheels, coupling poles, hounds etc., with fresh air slack lime, as well as your own shoes and see to it all dirt is off of the shoes and wagon. Then change your clothes from head to foot and don't go into your hog pens with the clothes you wore to haul exposed hogs till the clothing has been washed and boiled. Probably more cholera is carried on people's shoes than by all other methods combined.

No stock buyer or visitor should be allowed in your hog pens when cholera is any where around. It may mean the loss of many dollars to you. Dogs, crows, and running water may bring the disease to your pens from cholera pens, but in my opinion these cases are not as frequent as the above methods. Most states have laws stating the disposition to

be made of the bedding exposed hogs are delivered to the rail road stock yards on. Some states say the buyer must burn it in the yards, etc. Most states have laws concerning the sale of sick hogs, and the disposition that must be made of the dead hogs. In fact there are enough laws in most states. In Missouri, it is illegal, according to the act of the Missouri legislature, 1917, to sell sick hogs of any kind. (2) It forbids the driving or handling of sick hogs. (3) All dead hogs must be burned within 24 hours.

But with all the efforts of the legislature, experiment stations, sanitary boards, etc., the farmer will continue to suffer an average loss of $50,000,000 a year unless he takes much more precaution along the right lines in the future than he has in the past. Just as long as the farmer depends on drug or grocery store treatment, such as lye, stock foods, worm remedies, etc., to keep away the cholera, he'll lose his hogs.

Where is the farmer that believes he can feed such feeds and I can not give his hogs cholera by feeding them the organs of diseased hogs. There's not one farmer in fifty that would permit me to put such preventatives to any such tests. Yet farmers hold to it that those very things kept the cholera away.

Oh! you feed such things to keep your hogs healthy and thus prevent cholera, my observation has been, the hogs that are making the most rapid growth are as subject to the disease as any of the others, so to keep a hog healthy doesn't prevent hog cholera.

There are only two ways to prevent it. One is, to keep the infection of the diseased pens away from the well hogs and by the use of anti-hog cholera serum.

The former method is sane, safe, dependable and cheap. The latter is dependable and somewhat expensive.

SERUMS

You may at some time have used serum and it did not save your hogs, so you would say it was not dependable. First, why was it not dependable? If serum is kept at summer or early fall temperature, in a few days it loses its immuning powers. It should be kept close to 40 degrees. All veterinarians did not know this when they first began to use serum. Again, many people did not use serum in large enough doses and the hogs died. Some companies did not put out a first class

product, and various other reasons might be given for the failure of serums in the beginning of their use. Any medicine might fail if not properly used.

First, if you are going to immune your hogs by the use of serum, get a high class product. Nearly all experiment stations or agricultural colleges put out serum as cheap as a dependable product can be made. In fact, they put it out at as near cost as possible. After obtaining a known product, put in the full dose as directed.

It does not pay to under estimate the weight to reduce the serum cost. Many experiment station men consider the serum alone method safe for any one to use, while other stations advise the employment of a veterinarian.

With the serum alone method the farm that hasn't got hog cholera on it doesn't become infected, and it does not effect the reproductive powers of the sows or gilts. However, pigs under 75 pounds out grow the immunity in from 4 to 8 weeks, and must be vaccinated again, especially on farms where cholera has been. However, on farms that haven't had cholera, the rage may get over in that length of time and revaccination may not be necessary.

Hogs over 100 pounds usually can be marketed before they lose their immunity, and mature hogs usually stay immune. The older the hog, the greater the length of the immunity when the single method is used.

THE SIMULTANEOUS METHOD

This method of immuning consists in using anti-hog cholera serum and virus. The organism causing the disease and anti-hog cholera serum are placed in the hog at the same time but the injections are made with a separate syringe. Most experiment stations agree that one well informed on such work should make the injections. In some states it is a penalty of from $100 to $500 for any one other than veterinarians or representatives of experiment stations to use this method.

By the use of the simultaneous method, the hog becomes immune for life.

Some of the disadvantages are

I The losses due to vaccination are a little higher than by the use of the serum alone method.

II Your farm may become infected with cholera and new born pigs or newly purchased hogs after vaccination may develop the disease. This is especially true if any of the vaccinated hogs become very sick. When a vaccinated hog becomes sick by the double method, it is often a mild form of cholera, hence neighbors should be kept away from the pens, as the urine and feces may contain hog cholera virus.

III If the anti-hog cholera serum happens to be poor, the hogs develop hog cholera.

IV Some farmers claim the double method reduces the number of pigs a gilt or sow will produce. Extensive experimental data on this particular point is not available at present. The combination method is the same as the double method except the virus is injected about 3 days after the serum. As I see it, there is not any material advantage between the double and the simultaneous method.

A clean well limed and heavy bedded pen should be provided, and the serum injected in all hogs under the loose skin back of the ear. Put virus on opposite side of the serum. *USE NO VIRUS IN CHOLERA HERDS.*

Below 20 pounds, 20 cubic centimeters.
20 to 30 pounds, 20 to 25 cubic centimeters.
40 to 75 pounds, 30 to 35 cubic centimeters.
100 to 150 pounds, 40 to 60 cubic centimeters.
175 to 250 pounds and over, 65 to 80 cubic centimeters.

Four cubic centimeters are approximately one teaspoonful.

One pint is approximately 480 c. c. (cubic centimeters) or millilitres. One cubic centimeter or c. c. equals one millilitre or (mil.) or about 15 drops.

If the simultaneous method is used and cholera is in the herd, or the herd is dangerously exposed, or sick hogs are treated, the above dose should be doubled. Hogs with temperature over 103.5 should receive a double dose.

POISONING

(Cockle Burr)

When hogs eat poisonous feeds, they usually vomit, but with the cockle burr this is not true. Hogs will die in numbers as though they

had hog cholera if they eat the leaves of young cockle burrs.

After the plants have formed a half dozen or more leaves, the hogs either do not eat them or they do not poison them. The prevention for this trouble is well established. When hogs have cockle burr poisoning they often lose the control of their muscles as in lock jaw, become somewhat dizzy and may go blind.

INTESTINAL WORMS OF HOGS

The thorn headed and round worms are the ones that most frequently cause trouble in hogs. The former are from two to six inches long and the latter are from four to ten inches long and in shape and movement resemble a fish worm. The larvæ or young worms are picked up about the feeding places and deveop in the pigs intestines. Since it usually takes about six weeks for the worms to develop they are not usually considered to be the cause of trouble before the pig is six weeks old. When worms become too numerous they may cause permanent trouble indigestion by destroying the membrane lining the intestinal canal.

SYMPTOMS

It is not always as easy to be positive that hogs are worm infected as some people think, especially if the pigs have been well nourished from birth, enabling them to be kept in good condition. The symptoms usually given are a ravenous appetite, poor gains, cough, and the pigs become pot bellied and may expell one or more worms from the mouth. They often throw off worms with the bowel passages. My observations have led me to believe that hogs that are very badly effected with worms eat less before than after treating them. It should be remembered that lung worms may cause a cough as well as dust in the summer or bronchitis and hemorrhagic septicemia in the winter. However, a cough is a prominent symptom of intestinal worms in hogs.

PREVENTION

It must be remembered that the larvæ or young worm is thrown out of the hogs intestines with the bowel passages. In this way pastures and pens become infected and the larvæ is picked up with the feed. The

larvæ are thrown off in the greatest numbers while the hogs are being treated for worms, hence the necessity of cleaning up and burning all feces while treating the hogs to keep them from reinfecting themselves. It is a good plan to change the hog pastures every few years to avoid the larvæ of intestinal worms.

TREATMENT

To successfully treat pigs for worms it is necessary that

I The intestinal canal of the pig be empty. If it is not empty, the medicine will be so diluted that it will not be effective.

II To give a drug that will stupify or make the worm unconscious, others are not classed as worm removers.

III To see to it that each pig gets its dose. The one's receiving an over dose may be poisoned and the others that do not receive sufficient medicine will not be cured.

IV A physic should be given after treatment to remove the worms while numb and to clean the bowels of decaying worms.

Following are a number of treatments very effective for treating hogs for worms and are worm removers in the strictest sense of the word.

FORMULA 1

Santonin, 4 grains.
Fresh powdered areca nut, ½ dram.
Calomel, 1 grain.
Bi carbonate of soda, 1 dram.

(Note) Areca nut loses its strength and if the fresh drug is not obtained the treatment will be a failure.

(Dose) The above formulæ is for one pig weighing 100 pounds.

(Directions) The pigs should have received no food or water for 24 hours before the medicine is given. Neither should they receive feed for a few hours after being treated. Give the above drugs in as little slop as they will clean up in lots of five pigs each.

FORMULA 2

Turpentine.

(Dose) Give 1 teaspoonful for each 100 pounds live weight in a

thick middling slop or preferably skim milk, repeat for 4 or 5 mornings, giving ½ the normal feed 15 hours before each dose. Follow the last dose with 2 tablespoonsful of epsom of salts for each 100 pounds of weight given in middling slop. The treatment should be repeated in 10 days.

FORMULAE 3

Oil of chenopodum (*oil of the American worm seed.*)

(Dose) One teaspoonful for each 75 to 100 pounds live weight. Smaller pigs should be given a dose in proportion to the weight.

(Directions) With this treatment starve the pigs for 24 hours and give no water. Then give the above dose in 2 to 4 tablespoonfuls (1 to 2 ounces) of castor oil. Oil of chenopodum should always be given in castor oil, and treat each pig separately. To do this do not drench since they may get the drugs in the lungs and capsules should be avoided since they sometimes lodge in the pharynx and cause irritation if not swelling of the throat, but take a long handled iron spoon or syringe and with a hog mouth gag, hold the mouth open and place the oils well back on the tongue, removing the gag each time the oils are released. The hog should be held by a rope and not set up on the hams while the medicine is being given. (See cut on how to hold with a rope, page 154). This insures the proper dose to each pig, is cheap, safe, and takes less time than the turpentine treatment. One dose is sufficient. In 10 days it should be repeated. The pigs may be fed in 3 to 5 hours after receiving the oils.

FORMULAE 4

Powdered copper sulphate (*blue stone.*)

(Dose) 1 level teaspoonful for each pig weighing 100 pounds.

(Directions) After the pigs have had no feed for 24 hours, give the above dose in a thick middling and cracked corn slop. Feed no more slop than is necessary. Divide the pigs in lots of five and treat each lot separately. Give 2 doses 12 hours apart and repeat in ten days. After the second dose of each treatment, give in 10 hours, 2 tablespoonfuls of epsom salts in a thick slop, for each 100 pounds of live weight. The caustics as copperas and blue stone have been held by some to irritate the intestines and make the animals unthrifty, to say the least. Formulæs one, two and three can be purchased for less than the price

of one pound of pork, per pig treated, and the cost should not keep any one from getting the formulæ that serves them best.

Equal parts of sulphur, charcoal, glaubers salts and copperas, if kept continuously before hogs has a tendency to keep them free from worms. The Iowa experiment station recommends that they be kept in separate feeders and the hogs be allowed to take of the ones they need most, since more charcoal is craved with certain rations than with others and more sulphur in others. Then again, I imagine individual pigs differ.

STOCK POWDERS AND TONICS

Experiment stations have not obtained results from feeding of stock powders and tonics to hogs. I have met farmers who were very enthusiastic about a certain hog powder or tonic and credit the firms guarantee for much, but in a few years, I notice they are not feeding any powders at all or have changed the brand. My opinion is if the pigs are wormy, they should receive one of the above worm formulæ's and as to the tonic, it is not needed for its food value or to aid the pigs digestive organs to assimilate more food and the work it does to increase food digestion is absolutely an unknown quantity to the purchaser.

However, if such a tonic must be had, you can usually purchase it from your local druggist unless he is a stock food booster for about one third to one half what stock powder companies sell them for. Following I give a common one and equal to others. Commonly known as the government formulæ.

Charcoal, 3 pounds
Sulphur, 3 pounds
Salt, (sodium chloride) 3 pounds
Black antimony, 3 pounds
Baking soda, 6 pounds
Hypo sulphate of soda, 6 pounds
Sodium sulphate, (glaubers salts,) 6 pounds

Mix the above well and give 1 tablespoonful once daily in the slop for each 200 pounds live weight.

Another one is as follows, and more like the commercial stock foods.

Fenugreek, 8 pounds

Ginger, 8 pounds
Powdered gentian, 8 pounds
Sulphur, 8 pounds
Salt petre, 8 pounds
Resin, 8 pounds
Capsicum, 4 pounds
Linseed oil meal, 40 pounds
Powdered charcoal, 20 pounds
Salt (sodium chloride) 20 pounds
Wheat bran, 100 pounds

Feed 3 rounding tablespoonfuls once or twice daily for each 200 pounds of live weight.

Where the formulæ is printed on the can and the amount of each is not given, it will be found that they often contain many of the elements indicated in one of the last two formulæs.

LUNG WORMS

(Cough) (Quinsy)

This disease more often develops in the late summer and early fall. The hog probably breathes the egg of the lung worm into the lungs along with dust particles and the worm develops in the air passages and the lungs. The egg of this worm seems to have the ability to live for months under ordinary field conditions. Lung worms sometimes prove fatal by suffocation due to the accumulation of mucous in the air passages but a high per cent of the cases recover.

When a hog is effected with lung worm, often a form of irritating bronchitis develops and a peculiar harsh cough devleops which can be heard 200 or more yards away. To date, there has been developed no cure for the trouble. About all one can do is to keep the hogs out of infected pastures in the spring and early summer, since it takes the egg several weeks to develop into a worm. Creolin or coal tar steam vapor will give temporary relief. Sulphur fumes or burning of feathers in a closed pen is also said to be beneficial.

LOSS OF THE USE OF HIND QUARTERS

(Improperly Called Kidney Worms)

There is a worm living in the fat surrounding the kidneys and sometimes found in the kidneys proper that causes urinary disorders but has no connection whatever with the lost use of the hind quarters.

Kidney worm is so infrequent that I do not consider a discussion of any use in this book.

Hogs go down in the back for four reasons. They are bred wrong, injuries, hard floors and paralysis. The last is dealt with in the following pages.

Some families of hogs within the various breeds of hogs have too straight a back on them. That is, the back is not well arched and they give away in that part of the anatomy. Such families will go down if confined on hard concrete floors.

TREATMENT

When hogs go down in the back, feed a nourishing ration of oil meal middlings, tankage, etc., but less fat formers such as corn and thereby reduce the weight. Blister the loin and hips with a strong lineament and often they will get able to go over the scales to the slaughter house. In my opinion, there's no reason why hogs with such breed weakness should not be used for meat.

Avoid the use of straight backed sires and dams. I do not advocate breeding fish backed hogs but all hogs should have some arch in the back.

RHEUMATISM

(Lameness)

The cause of rheumatism is not well established. Exposure to cold and dampness are given as inducive to it. Cooling off of animals quickly is another cause. Often animals that have their weight reduced rapidly develop rheumatism.

SYMPTOMS

The effected hogs get stiff in the muscles of the organs of movement and the back. They often develop lameness. This lameness may be mistaken for paralysis. In some cases the joints swell.

TREATMENT

Friedberger and Frohner recommend rubbing the effected muscles or joints with a linement composed of equal parts of camphor, turpentine and arnica and bandaging the same. They give twice daily in a capsule ½ to 2 drams salicylate of soda, depending on the size of the pig. They report excellent results with the salicylate of soda.

PARALYSIS

Paralysis is the result of nervous disorder manifesting itself in loss of the use of the muscles of the body. In hogs the hind quarters are more often effected and are drug around by the unfortunate animal. The nerves going to all parts of the body muscles have their origin in the spinal cord. The nerves coming from the spinal cord pass through openings of the spine. When the vertebræ get out of adjustment it causes pressure on nerves that emerge and some believe a portion of the paralysis of hogs is due to the vertebræ getting out of adjustment. It is possible strains, blows or kicks might have such an effect. In human practice, the readjustment of vertebræ in human patients has accomplished much, but the importance or significance of such adjustments in veterinary practice is to be proven. Some hogs seem to become paralyzed without apparent cause. Paralysis often occurs in aged sows that have pigs and become poor. It is frequent in sows immediately before farrowing.

TREATMENT

The sow should receive as the bulk of their ration, milk bran shorts, tankage or oil meal with a very limited quantity of corn. The bowels should be kept open from the beginning by the use of raw linseed oil or epsom salts given in water and in addition give 10 to 15 drops of tincture of nux vomica 3 times daily in water to each 100 pounds of live weight. Nux vomica when given in too large a dose causes the muscles to twitch.

PILES IN HOGS

(Prolapse of the Rectum)

Piles is caused by unusual straining in hogs. Hogs may get fast by the abdomen or become constipated and piles result.

SYMPTOMS

In piles the feces may have blood passed with them and the rectum protrudes. In most cases there are no tumors formed at first.

TREATMENT

Most cases can be permanently cured by starving the pig 15 to 18 hours and giving in water with a syringe 5 tablespoonfuls (2½ ounces) of epsom salts for each 100 pounds of live weight, followed by the following operation.

Have an attendant hold the pig by the hind legs and wash the exposed rectum with strong alum or oak bark water. Cover the guts with the fingers and work the lower part back in place by even, firm and slow pressure. Some lard applied to the rectum may help to replace the rectum. If the swelling is severe, it may be reduced by bathing the rectum in warm water for ¾ to 1 hour.. Do not try to press but hold what you have and gently press between strains. After the guts are in take a stitch across the anus but do not draw too tight so the body wastes cannot pass out. After the rectum is held in place several days by the doubled cobbler's sewing thread, they seldom come out again.

ABORTION IN SOWS

Sows may abort from over feeding, feeding a feed too rich in protein, or medicated stock foods. Abortion may be caused by drugs given sows while pregnant. Sows that are obliged to crawl over logs or boards to go through narrow openings often bruise the pigs with their own weight killing them and causing abortion. Some believe a contagious abortion exists among sows which at present seems to go with herds following abortive cows. A fair farm ration for brood sows is 45 per cent oats, 30 per cent corn, 20 per cent wheat middlings and 5 per cent tankage. I

have always been able to produce larger and stronger pigs when I fed tankage than by any other method and have never established any bad results from feeding it. Sows that abort are no more likely to abort again in my opinion than sows that have never aborted.

DIFFICULT FARROWING

Difficult farrowing is not infrequent in gilts. It may be due to too small a natural opening, blows, or improper care. After the water bag bursts, usually pig delivery will begin within two hours. However, I have attended to cases that upon examination proved to be normal, where the pigs were not born for six hours after labor pains began and the pigs were all born alive, merely by letting the sow alone. Pigs are usually born head first but are often born rear end first. After 2 hours of labor without the birth of the pigs, an examination is advisable. When the oiled hand is thrust into the opening and a dead pig is felt, or the pig is wrongly presented, the sooner help is given, the better, but if the pig is coming right and alive my advice is to wait a while and re-examine. In most cases after 5 hours of labor, the second pig will be dead, and after 24 hours the entire litter will be dead.

HOW TO AID THE SOW

The injections of warm water and oil with a hose and after the water is in, turn the sows rump sharply lower than the head. After two or three attempts at this if it fails insert the hand and try to secure the pig with the hand. If this cannot be done, secure a piece of new number nine wire, bend the wire to make a two inch hook slightly back on either end but these hooks should be exactly opposite, so the operator can tell where the one in the sow is pointing after the hooks are bent. Heat the wire red hot in a flame the entire length and cool it and rub it off with a rag wrung out of strong dip solution, insert one hand in the opening if possible and try to hook the wire into the lower jaw of the dead pig. If the pig is cross ways of the opening try to push it back before turning or trying to hook the jaw. After the jaw is secured, pull easy giving plenty of time. If the lower jaw pulls out, hook in the upper jaw or in the eye sockets, but be sure the mother is not hooked and badly torn.

Veterinarians sometimes have to take the pigs out through the side by cutting into the womb back of the last rib. With reasonable care about one-half of such operations should be successful. Pig forceps, as a usual thing have no advantage over the number nine wire. However, on page 17, fig. 1, a desirable kind is shown. With these it is impossible to close up on the lining membrane of the sow. Forceps that will close up tight should not be used. A sow that has difficulty in farrowing should be washed out with a solution of dip, lysol or creolin once a day for three or four days. ¼ to ½ pint of any of the above to one gallon of water is sufficiently strong for this purpose.

THUMPS IN PIGS

This is a digestive disorder comparable to hiccoughs in man. It is caused by too much feed and lack of exercise. It is common in pet pigs. The treatment is to give them a dose of salts or raw oil preferably the latter, make them exercise, check up on the feed for a few days and feed laxative feeds, as grass, oil meal, middlings, bran, etc.

SCOURS IN PIGS

Scours is nearly always caused by improper feeding of the sow, unhygienic surroundings and cholera.

Experience has led me to believe that half of the making of a good hog is in the feeding before the pig is born. Sows fed tankage, a limited amount of corn and pasture produce pigs far superior to the sows receiving no tankage. Too many farmers make the bad mistake of beginning the feeding of protein concentrates just before or after farrowing which causes the pigs to scour unless fed very judiciously at first. Any change of feed at farrowing time may cause scours. Too much feed just after the sow farrows even though she is used to it, may cause scours in the pigs.

TREATMENT

Sharply reduce the feed of the sow for several feeds, and if the pigs do not improve, give the sow with a syringe, 2 drams (2 teaspoonfuls) of tincture of opium (laudanum) in ¼ pint of water every 8 hours, till the

scours in the pigs are checked. If the pigs are several weeks old, they should be given 1 tablespoonful, ½ ounce castor oil for every 30 pounds of live weight. In ten hours, give every 5 hours a few drops of laudanum.

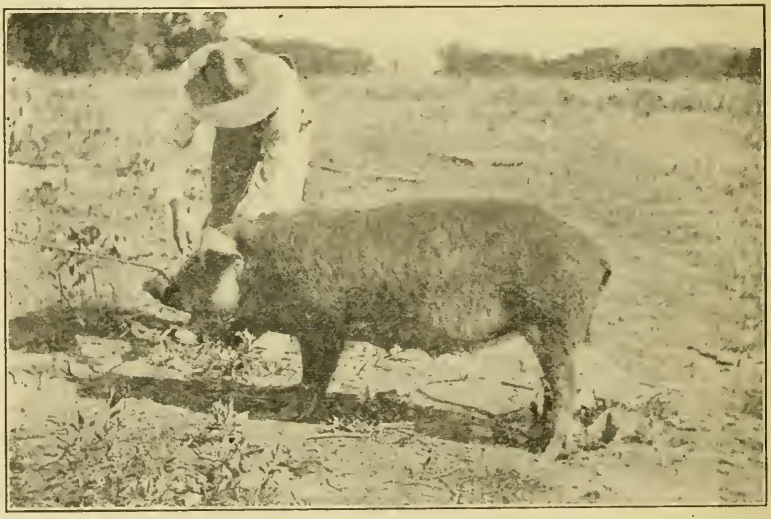
Older hogs can have the bowels checked by giving for each 125 pounds live weight,

(2 teaspoonfuls) 2 drams bismuth sub-nitrate
(2 teaspoonfuls) 25 to 30 grains of tannic acid.
(2 tablespoonfuls) 1 ounce bi-carbonate of soda

Give the above in milk or water every 8 hours till the bowels check.

CASTRATION OF HOGS

Pigs should be castrated when seven or eight weeks old. At this age the operation is not so severe on the pig as it would be if they were permitted to go until older. They are easier handled and if a loss occurs the pig is not worth as much money. Most any one can remove the tes-

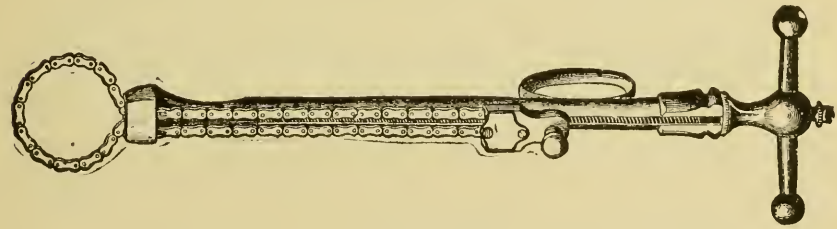


(Method of holding large hogs while ringing, removing the tusks, or roping for castration of large hogs.)

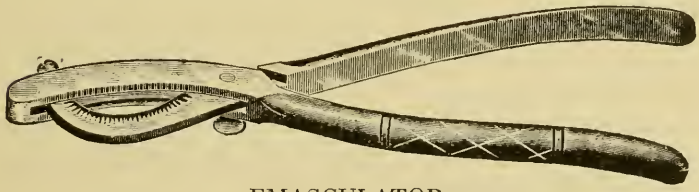
ticle from a pig, but not everyone can perform the operation and have none of the pigs swell up and get stiff. The assistant should hold the pig secure on the left side by placing the knee on the neck, and holding

the front foot with the left hand and drawing the rear foot well forward with the right hand. The lower testicle should be seized by the operator and with a sharp castrating blade an incision should be made in the sack beginning at the extreme bottom part of the sack and cutting parallel with the median line of the testicle bag. The opening should go through the skin and membrane around the testicle permitting the testicle to come out of the opening with ease. Then after separating the cord and membrane or striffen, as it is sometimes called, with the knife by cutting the striffen, the cord should be grasped with the hand as low as possible and pulled till it breaks.

If the opening is not made at the extreme bottom of the scrotum or if the opening is not parallel with the median line of the scrotum, a pocket is formed and pus accumulates and the pig gets stiff and looses the appetite and may even develop a large unsightly, disagreeable smelling ulceration called a chanpigon or scirrhus. Such a tumor or swelling may develop because the opening is not large enough, or is not sufficiently drained by opening up low enough. The opening should be large enough to let the testicle come out easily and not have to be popped out. A small opening heals too quick and shuts the pus up in the scrotum.



ECRASEUR



EMASCULATOR

The use of a good antiseptic wash after castration will aid greatly in preventing swelling and lock jaw from developing. Sheep dip, creo-

lin, lysol, or carbolic acid and lard are good to put into a wound with a syringe or long neck bottle after castration. Old boars may be castrated the same as pigs. I have castrated them exactly the same way with good success. However some people prefer to use an instrument called the emasculator or ecraseur to crush the cord.

These instruments are convenient and safe to use in the castration of all animals. Hogs will not stand it to lose as much blood in proportion to the body weight as a cow or horse. The ecraseur crushes the cord and prevents bleeding.

CASTRATION OF RUPTURED PIGS

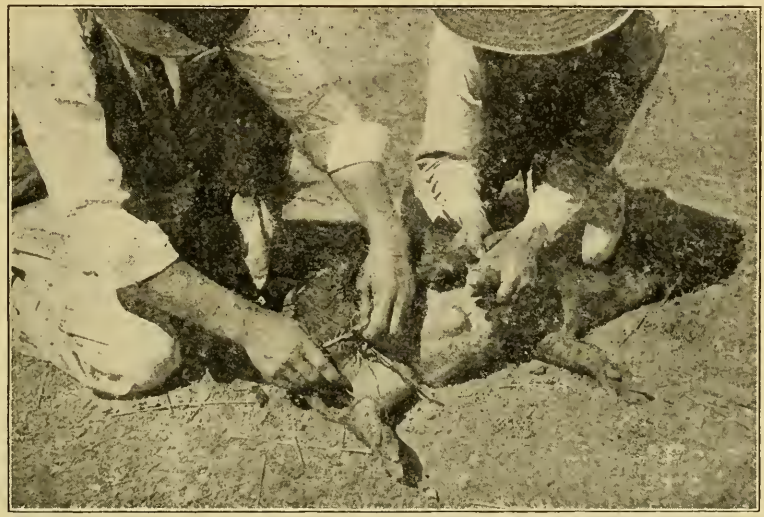
It is not uncommon to find a portion of the intestines in the same sack with the testicles. Such pigs should be kept off feed but not water for eighteen hours before castrating.

Secure the following instruments to aid in castrating, however, it is possible to fix a ruptured pig up with only a knife and needle and thread. Have three feet of cobblers shoe thread, double it in the needle and wax it well with rosin or bees wax to prevent tearing the striffen. Two artery forceps will aid in getting the striffen. Put the needle and all the metals including castrating knife in a pan of 5 per cent carbolic acid or dip water. Have the attendant secure the pig by the hind legs and hold him with the heels in the air and try to work the intestines into the body cavity before cutting. If this cannot be done, castrate as usual, but do not remove the testicle cord. Before castrating, be sure no intestines are in the path of the knife.

After castration, the lower intestines should be gently, slowly and firmly pressed back in the body cavity with several of the fingers, while the pig is held by the hind legs. Do not try to press the guts into the body too fast. After the intestines are all in, by having the attendant hold the testicle and grasping the lining membrane around the cord and looking down the cord the opening into the body cavity may be seen and if the striffen is torn several stitches in the striffen may be necessary. With the artery forceps or fingers, seize the striffen on the sides of the cord and raise it up.

A stitch should be taken through the striffen as low down as possible but do not include the cord. This stitch, when tied around the striffen closes the opening to the body cavity and the guts cannot come out.

Remove the testicle cord and cut the needle loose from the thread and tie the striffen up, closing body cavity opening and the guts can not come out. After all is done, wash well with a 5 per cent solution of creolin, coal tar dip or carbolic acid solution but do not sew up the testicle sack. Ragged edges of striffen exposed should be trimmed.



This shows the proper method of castrating a pig where the intestines are in the testicle sack. The operator has the testicle in the left hand and as soon as it is pulled, the strings showing will be tied around the striffen held by the artery forceps. The strings are above the left hand and below the right. Two will be tied on the side of the left hand and two on the side if the right hand.

TUSKS, HOW REMOVED

Tusks are a detriment on nursing pigs or old boars. Pigs fight each other away during nursing and in large litters make the worst kind of sores on the sides of the face. This can largely be prevented by taking a small sharp pair of pincers and clipping off the tusks before the pigs

are twenty four hours old. In old boars, pincers or a hand saw may be used to get rid of these dangerous weapons. Long handled pincers such as blacksmiths use to trim horses feet are excellent to clip the tusks of a boar with. See cut page 17, fig. 14.

LOCK-JAW, TETANUS

Lock jaw may develop in a few days or several weeks after castration and is more often caused by castration not being done under sanitary conditions or lack of proper drainage. However, it might develop from other wounds.

Lock jaw bacteria can not live in the presence of air hence if the wound heals over it makes a favorable location for lock jaw.

SYMPTOMS

The muscles become rigid and the hog is easily startled. They usually can open their mouths sufficient to take liquid foods and sometimes corn. Usually they lose the use of the muscles of the fore or hind quarters separately. 80 to 90 per cent of the cases die.

There is a tetanus anti-toxin kept by most of the well stocked drug stores for human use. The injection of 400 to 600 units under the skin back of the ear for every 100 pounds of live weight daily until improvement develops, in some cases seems to be of benefit.

SCAB, MANGE, ITCH, SUN SCALD

Scab is more often met with in younger hogs but may be found on hogs of any age. Pigs nursing a scabby mother often develop bran like itching scales on the face or at the base of the tail before they are a week old. The disease is caused by a mite that burrows under the skin and lives on the blood and lymph of the hog. Wet, hot weather favors the development of the mites. The mites go from one hog to another just as lice get from hog to hog.

TREATMENT

Dip solutions or kerosene emulsion are efficient to destroy the mite

of scab when used as recommended for hog lice. Equal parts of sulphur and lard or vaseline are efficient to destroy scab mites if well rubbed in.

HOG LICE

Hog lice do hundreds of dollars worth of damage every year by sucking the blood of hogs and causing the hogs to become unthrifty. It is possible to let lice breed so long on hogs that the vitality of the hog is weakened and they will die, solely from loss of blood.

TREATMENT

To rid a place of lice it is necessary to clean the sleeping quarters several times and spray the same with a lice killing solution before replacing the bedding.

Many remedies apparently kill a large number of the eggs as well as the lice but it is often necessary to give several treatments to the hogs ten days apart to kill all the lice.

TREATMENT

Hog and sheep dips are somewhat expensive and in most cases have to be used stronger than the manufacurers recommend to get the best results. Crude oil is safe, economical and satisfactory to use on a large or small scale.

In using crude oil it is only necessary to keep the surface of the water of the concrete hog wallow or dipping tank covered with the crude oil to get satisfactory results. It can be used on a rubbing post or petroleum may be used.

KEROSENE EMULSION

Take 2 pounds of laundry soap, shave it up fine with a knife, boil in 1 gallon of water, remove from the fire and stir well while 2 gallon of coal oil (kerosene) is being mixed with it. This will make a milky solution and the coal oil and water will mix by using the soap. The above is sufficient for 9 or 10 gallons of water.

Some prefer to make kerosene emulsion as follows.

1 part kerosene

1 part clabber milk

Churn the above till they mix and have a milky appearance and add 9 parts of water.

The kerosene emulsion can be used in dipping tanks or with a sprinkler.

NECROTIC STOMATITIS

Decay of the Bones and Tissues of the Mouth

GENERAL DISCUSSION

Necrotic Stomatitis may be found in either shoats or suckling pigs. I have never observed a case in aged hogs.

The germs are discharged from the body with the saliva and the bowel passages, which explains how it may be spread in a herd by a common feed trough fighting or picked up with corn fed in pens that harbor infected hogs.

SYMPTOMS

In shoats the disease usually begins in the gums. In pigs I have more often noticed it first on the sides of the head where they tusk each other while nursing. The affected tissue is at first red or bluish red very tender and bleeds easily.

After a few days the tissue begins to decay and may fall out or the bone and tissue may decay together with a characteristic foul odor. The pigs become weak and are not able to demand their share of the food and they slobber at the mouth and champ the teeth. The course may cover a number of days or last only a few days. Where I have observed the disease, from 10 to 30 per cent of the herd usually die with the disease if no precaution is given.

TREATMENT

If possible separate the effected pigs from the well ones and do not feed them out of the same troughs or bucket since the saliva and bowel passages of effected pigs are common carriers of this disease. Thoroughly clean all pens, feeding and sleeping quarters and sprinkle such places with water containing 1 pint of creolin or sheep dip to each gallon of water used.

Scrub and dry in the sun all feed troughs once daily with a creolin or dip solution.

The sores of effected pigs should be painted twice daily with

Tincture of iodine 1 part

Witch hazel 4 parts

Or a 5 per cent solution of lime chloride.

Or a 1 per cent silver nitrate solution.

Any druggist should be able to prepare any of the above and they should be applied with a feather or cotton swab. Care should be taken to apply only sufficient to cover the sores.

SHEEP DEPARTMENT

WORMS IN SHEEP

Stomach worms (strongylus contortus), pin worms and tape worms are the worms more often infecting sheep. Any one or all may be found in a sheep that has just died but of all of these, the stomach worm living in the fourth stomach is the greatest enemy of the sheep raiser, and is nearly always the worm responsible for the loss when the loss is due to worms.

When a farm becomes infected with worms it is hard to eradicate them, hence great care must be exercised in the purchase of new sheep for a flock. If all sheep were sold off of an infected farm and no more wormy sheep brought on an infected farm, it would be from one to two years before the farm would be free from worms. On high, well-drained farms, with no wet valleys or still water, and under the most favorable weather and temperature conditions a farm might be freed of worms in less than two years. The farm might become worm free in one year if all infected sheep were sold and no new ones brought on the farm. But if there are stagnant pools and swampy valleys or it is a wet year it would require much more than a year. Not that I would recommend the sale of all sheep in all cases, but such uncontrollable conditions are favorable or unfavorable to worm development. Frequent change of pasture aids in lessening worm losses.

SYMPTOMS

The lambs and more delicate sheep are usually the first ones attacked. The lambs do not grow well although they may eat more than normal. The lambs continually grow weaker and may develop a diarrhœa. The skin has a paper like texture, the legs, belly and chin may swell up in the morning and be normal later in the day. The disease may take on the form of an epidemic and one or more die every day. In any case, it is wise to open one immediately after it is dead and try to locate the worms. If stomach worms are suspected cut open the fourth

stomach, separate some of the liquid content of the stomach from the wall and spread on a thin board or glass. Stomach worms are very hard to see. They are about the size of a pin with a reddish color and a U shape.

TREATMENT

The man owning a clean herd of sheep should be careful not to purchase sheep having worms.

Any treatment should be preceeded by a fifteen hour fast. In my opinion the following formulæ is among the best for worms in sheep.

Powdered nux vomica 2 drams (2 teaspoonfuls.)
Powdered iron sulphate 5 drams (5 teaspoonfuls.)
Arsenious acid 1 dram (1 teaspoonful.)
Fresh powdered areca nut 2 ounces (4 tablespoonfuls.)
Salt 4 ounces (8 tablespoonfuls.)

The above is 30 doses for one grown sheep and should be fed once daily in ground feed for 10 days to one month, depending on the results. Sheep fed such vermifuges should be divided in lots of not over 10, so one sheep will not get too much of the drug.

Gasoline has long been recommended by herdsmen. The dose is 2 tablespoonfuls for grown sheep. Just enough gasoline should be given so that the sheep does not stagger. Staggering indicates too much. Gasoline should be given in 7 or 8 tablespoonfuls of sweet milk. Repeat in 10 days.

DRENCHING SHEEP

Great care must be taken in drenching sheep or the animal will strangle. A good way is to get three or four feet of gas jet tubing 3-8 of an inch inside diameter, insert a funnel in one end and place the other end, (8 to 10 inches) in the sheeps mouth so it gets below the wind pipe and pour the milk and gasoline slowly in the funnel.

After the worms have been eradicated, it is wise to keep them out by keeping the following before them.

Powdered iron sulphate, 2 pounds
Powdered sulphur, 2 pounds
Clear colored powdered copper sulphate, 2 pounds
Salt, 94 pounds

FORAGE POISONING

Ensilage, Corn Fodder and Other Plant Poisoning, (Improperly Called Cerebro Spinal Meningitis)

Brain disorders may be due occasionally to blows on the spine or central nervous system, but more often poisoning of sheep is due to the feed which they receive.

Among the more common plants found in pastures that cause poisoning are death camas, water hemlock, calico bush, very young cockle burrs, spoon weed, low laurel, larkspur and loco weed. Sheep may be poisoned by eating wind fall apples. Poisoning more frequently occurs when the sheep are changed from one pasture to another and are not used to the particular weed. Poisoning more often occurs from the dried feeds that are fed in the winter. The poisoning may be in the feed when eaten or it may develop after the sheep takes the food into the stomach. Moldy fodder, stunted corn stalks by drouth, or frost and moldy ensilage may all contain the poison within themselves.

Dry clean corn fodder, dead blue grass or water grass and shredded corn fodder may cause a loss in the flock solely due to their indigestibility. The food lays in the stomach and the sheep develops serious brain disorder often terminating in death. The patient usually goes in a circle or turns round and round, may stagger or reel against fences or buildings. With plant poisoning, such as sheep obtain in pastures, they may or may not show brain disorder. Often they froth at the mouth, have a staring look out of their eyes and become sick. Forage poisoning of sheep may be confused with hemorrhagic septicemia. (See cattle.)

TREATMENT

Remove the cause and feed lightly for a few days. Keep the bowels open. 4 tablespoonsful epsom salts may be given a grown sheep in ½ pint of luke warm water. Feed laxative feeds.

BLOAT

(Gaseous Distension of the Rumen) (Hoven)

This disease may come on suddenly and the animal may die in a very few hours or it may come on gradual and reappear every few days,

The rumen in the left flank may get about so large, much like a drum, and cause no misery or it may continue to enlarge and produce a great deal of misery. It is usually caused by a sudden change of diet, as turning sheep off of dry feed into leguminous pasture as clover alsike, alfalfa, vetches, etc. Such feeds are more likely to cause bloat when damp from dew or rain. They are more likely to cause it when the animal is not accustomed to such feeds and they gorge.

SYMPTOMS

The sheep becomes restless, may breathe with the mouth open, turns the head back or towards the flank. The rumen in the left flank usually becomes enlarged and some pain is manifested.

TREATMENT

Elevate the front feet higher than the back feet, knead the rumen with the fingers and rub the abdomen with the knee to try to start bowel action of the sheep. A bit in the mouth may induce belching. 1 to 2 drams (1 to 2 teaspoonfuls) of chloral hydrate or 2 to 3 drams (2 to 3 teaspoonfuls) of baking soda either, given in one pint of water are excellent to stop gas formation. 1 to 3 teaspoonfuls of turpentine may be given in 1 pint of castor oil, raw linseed oil, or lard to stop gas formation. (See article under stomach worms how to drench a sheep, page 163.) If the swelling is not reduced and the animal does not improve with the above, puncture the rumen as advised in bloat in cattle on page 86. The canula or hollow tube may be left in 24 to 48 hours.

PILES OF SHEEP

(*Prolapse of the Rectum*)

Piles of sheep are not infrequent where the sheep are fed too much of a coarse dry feed during the winter months. In piles, a portion of the rectum protrudes from the body.

TREATMENT

In previous years the treatment for piles has been largely surgical. Have an attendant hold the sheep and wash the protruding rectum with oak bark tea or alum water, gently and slowly push the rectum back into

the body with the fingers. Then take a firm stitch across the rectum with a twisted waxed cobbler's sewing thread doubled several times. The stitch should be drawn sufficiently tight so that when the bowels operate, the opening cannot get larger than normal. If the stitch is held in place a few days, it is very infrequent that the disease reoccurs. It is wise to feed more laxative feeds to sheep that become effected with piles.

CONSTIPATION COLIC

This is usually caused by too much dry feed. They stretch themselves and evidence pain.

TREATMENT

2 tablespoonfuls epsom salts or castor oil
1 teaspoonful of ginger
3 to 5 drops of oil of peppermint

The above will usually bring about recovery. One half the above is a dose for a lamb. See the article under worms for method of drenching sheep.

DIARRHOEA

Diarrhoea can be checked by giving 1 teaspoonful to every 60 pounds of live weight of equal parts of salicylic acid and tannic acid every 4 or 5 hours. The acids should be preceeded several hours by 5 or 6 tablespoonfuls of castor oil. See scours of calves.

SHEEP SCAB

(*Sheep Scab*) (*Mange*) (*Itch*)

In some sections, sheep scab has caused more loss to the sheep men than any other one disease. Certain sections have reported fifty per cent of the flocks effected. Yet there is probably no disease of live stock that responds as well to proper treatment as sheep scab. The disease is caused by a greyish mite somewhat resembling a spider in shape and about 1-50 of an inch long. The eggs hatch in 7 or 8 days after they are deposited by the females and the young are sufficiently mature to lay eggs in two weeks after they are born. As far as is known, no

other farm animals are effected with the mite causing sheep scab. However, the mite causing scab of cattle is quite similar. Sheep scab is introduced into healthy herds by the introduction of scabby sheep or harboring healthy sheep in stock cars, pens, or barns that have previously been occupied by scabby sheep. Just how long such inclosures or pastures will hold the infection seems to vary with the weather conditions.

The mite seems to live longer without the sheep in summer. An infected barn would probably harbor the disease from April to September. In cold weather 30 days would probably be the limit of life of the mite without the sheep. However the scab seems to thrive best on sheep before they are shorn. After shearing, the disease often is not noticeable till fall, and then may reappear.

SYMPTOMS

The first symptom that attracts the shepherd's attention is itching or rubbing of the sheep against fences, posts, buildings or any object the sheep may come in contact with.

The back, flank, sides or tail are the first places attacked. The mite does not bother the head, bare legs, chest or abdomen. The rubbing is especially noticeable after the sheep become warm by driving and is more noticeable in the evenings. At this stage of the disease if the wool is parted, a reddish or yellowish nodule the size of a timothy seed may be found on the skin. These spots may be scattered over the regions effected or the one spot may continually grow larger in area till a large per cent of the wool is lost. After the first symptoms appear, (itching and nodular spots) the wool of the area will bulge out further than the wool surrounding and it may become yellowish at first, no larger than a pin head. After the wool is lost the nodules of the skin or scabs may crack open and bleed. The sheep becomes emaciated and weak. Sometimes wool is lost from sheep from an unknown cause. Corn is supposed to cause loss of wool when excessively fed. Lice or ticks might cause itching, so an exact diagnosis can only be made by finding the mites. They are more numerous at the outer surface of the nodular swelling close to the skin. Pull some of this wool and a portion of a scab, place it on black paper and try to find the mites smaller than the diameter of a pin and 1-50 of an inch long. A hand reading glass will aid the eye in locating the mites. A warm room will induce them to crawl. The finding of these grey mites is not so easy as one would suppose but it

may be necessary to find them to establish sheep scab.

TREATMENT

Coal tar and creolin dips are not used by the government in the official dipping of sheep and cattle for scabies. However, some sheep men claim beneficial results from the use of such dips. Either tobacco decoctions of lime and sulphur preparations are the preparations permitted for use in the official dipping of sheep by the government. At present such a list of manufacturers may be obtained from the Bureau of Animal Industry, Washington, D. C.

Such preparations are quite variable and should be officially recognized or made at home.

LIME AND SULPHUR DIP

Lime and sulphur dip is very efficient for the destruction of sheep scab if properly made and applied, and if used as directed below it will not injure the wool.

I Weigh accurately 24 pounds of flowers of sulphur

II Weigh accurately 8 pounds of unslacked lime

III Measure accurately 100 gallons of water.

IV Place the lime in an iron kettle and cover with enough water to make a thick paste.

V Sprinkle 24 pounds of flour of sulphur over the lime paste.

VI Add at least 25 to 35 gallons of water and boil till the sulphur disappears from the top which will be in about two hours.

VII Add enough water to make 100 gallons of solution. If the sheep have not been recently sheared place all the lime-sulphur solution in two barrels and allow it to settle and use only the clear solution which can be drawn out with 5 or 6 feet of rubber tubing.

The lime-sulphur sediment is injurious to the wool. Dip the sheep as directed under the coal tar dips, being very careful to saturate all parts of the wool. Repeat in 10 days or 2 weeks.

TOBACCO AND SULPHUR DIP

If properly made, tobacco and sulphur dip is effective for destroying scab in sheep. 16 pounds of sulphur should be used to 100 gallons of water and about 21 pounds of good tobacco leaves.

If the tobacco is low in nicotine, it may fail to destroy the scab mites. If the tobacco is strong in nicotine, 21 pounds will be plenty. If too much is used the sheep will get sick hence it is wise to dip a few and wait 20 or 30 minutes to learn whether or not it is going to make them sick. Tobacco decoction is made as follows. Soak 21 pounds of good tobacco leaves in a sack in warm water for 24 hours in a covered kettle. Heat to boiling but do not boil, let cool for 2 hours, squeeze the juice out of the leaves in a lard or cider press, add enough soft water to make 100 gallons and stir in 16 pounds of sulphur, and dip as directed for coal tar dip. Tobacco-sulphur solution must be continually stirred while dipping and a fresh lot should be made for each time the sheep are dipped.

In dipping sheep, it is necessary that all parts of the body become

(This cut shows an open fleeced sheep, which are usually light shearers and more subject to the disease than the compact fleeced sheep. This can be eliminated by proper selection of the breeding flock.)

wet which requires some period in the tank and some manipulation of the head and neck.

NASAL CATARRH OF THE SHEEP

Nasal catarrh is not infrequent among sheep exposed to the rain and dampness during cold weather. While it is not particularly dangerous, it is disagreeable and will prove dangerous if the exciting causes are continued.

With catarrh a discharge comes from the nostrils and the sheep become unthrifty.

Open fleeced sheep are more likely to develop catarrh than those possessing compact fleece.

TREATMENT

Pine tar smeared on the nose is of some benefit. A tablespoonful may prove beneficial if given internally. It is advisable to sell the cases that have become chronic and make all effort to protect the sheep from damp snows and rains.

GRUBS IN THE HEAD

Grubs can be found in the head of most sheep after the summer months, but probably do not cause as much irritation as some people think. Grubs are the larvæ of the gad fly. The gad fly lays her eggs in the nostrils and these nostril openings run to points even and between the eyes and the grub works his way into the head.

TREATMENT

Bore a number of 1½ to 2 inch augur holes in a log, fill them nearly full of salt and smear the edges with pine tar and as the sheep eat the salt they will smear their noses with tar which will keep away the fly. This plan should begin about May 15 and be continued throughout the summer. Some smear the tar on the sheeps nose every two or three days to keep away the fly.

I am of the opinion that grubs of the head do not cause as much annoyance as some people think, since post-mortem examination of the heads

of healthy sheep often show grubs. Brain disorders are often caused by forage poisoning.

LIVER ROT

(*Liver Rot*) (*Distomatosis*)

This disease is more prevalent during wet years, or among sheep pastured on low or overflow lands.

The liver fluke passes a portion of its life in a snail which is about 1-50 of an inch long. These snails prefer low, wet ground rather than pools. The worm emerges from the snail to fasten itself to the grass, usually the lower portion of the grass and for that reason liver rot is more prevalent in pastures that are closely grazed. The worm probably gains entrance to the liver by burrowing with its pointed head. In the liver, it develops sexually. It then makes its way back to the intestines through the bile duct and passes out with the feces and again enters the snail where it multiplies.

SYMPTOMS

Sheep usually do not show the evil effects of the worms until several weeks after the first worms have entered the liver. It more often effects the lambs and yearlings. Liver fluke is more prevalent during the fall months but may be in a herd all winter, killing off few or many. Some of the stronger or older sheep may apparently recover, but the disease may reoccur. The liver of effected animals always shows the effect of the disease after slaughter or death. The sheep loose the appetite, the skin and membrane becomes pale and paper like, the sheep gets weak and the eyelids and sometimes the throat swells. The cases take a lingering course of from two months to a year.

TREATMENT

Pastures effected with the snails producing the larvæ must be avoided during wet seasons after May 1. Sprinkling of salt or lime on effected pastures seems to be beneficial. It is claimed by Thomas that salt licked by sheep will kill the worm while in the stomach.

POULTRY DEPARTMENT

FOWL CHOLERA

Fowl cholera is caused by a specific germ, visible under the high powered microscope. It is passed from the diseased bird with the bowel passages, and from such infected pens or yards, healthy birds develop the disease, as the germs are picked up with the food. Most any fowl will take poultry cholera and hence pigeons or other birds might carry it from farm to farm by their droppings. However, it is probable most of the cholera is carried by human beings the same as hog cholera. People get curious to see how fowls act with cholera and go to see their neighbors sick birds and carry the infection home to their healthy birds on their shoes or utensils. Feeding tankage in liberal quantities or a poor grade will often cause bowel disorders.

SYMPTOMS

Like hog cholera a number may die off in a very few days or the disease may linger months killing a bird occasionally. The birds show the first symptoms in the bowel passages which become yellowish, soiling the plumage on the rear of the body. Then the appetite is lost; the crop may retain the food and be distended with gas. The bird develops a diarrhœa which in the last stages of the disease assumes a green color. There is intense thirst and less desire for food. The wings and head droop. After death, blood ruptures can be seen along the digestive tract which are often as large as a pin head.

PREVENTION

Stay away from cholera pens and yards. If it gets into your flock, shut the birds up as soon as they show yellow diarrhœa and use a pair of overshoes to enter the cholera pen with and remove them as you leave the pen. This is to prevent carrying infection to healthy fowls. Do not use pans or troughs of the cholera pen in a well pen. Keep straw in the cholera pen and shelter, and burn all straw in pen. If cholera

fowls are killed, kill them where they are immediately, and deeply bury or burn as the blood is very dangerous to healthy fowls. Scatter lime in the cholera pen and house, as well as around the eating place of the well birds. If possible have a separate attendant for the sick birds who does not go near the food or pens of the well birds.

Copperas water using 10 pounds to 50 gallons of water is good to sprinkle in the yard of well birds to kill cholera germs.

TREATMENT

Treatment is usually unsatisfactory. The best plan is to sell off all well birds and buy eggs to hatch with the following season, keeping the houses and pens disinfected from time to time. However, 2 teaspoonfuls of potassium permagnate to 3 gallon of water may be made up and 1 tablespoonful given the sick birds every hour. Potassium permagnate often will hold the disease in check among the well birds if made up as follows. Place 2 drams (2 teaspoonfuls) of potassium permanganate in a ½ pint bottle of warm water, shake well several times, allow the crystals to settle to the bottom of the bottle and add 1 tablespoonful (½ oz.) of the clear wine colored solution to each two gallons of the drinking water of the well birds. Enough should be added to make the drinking water wine color.

INTESTINAL WORMS OF CHICKENS

(*Lameness*) (*Paralysis*) *or* (*Brain Disorders*)

The intestinal worms cause more loss to the poultry raiser than is commonly supposed. Some years ago as many as 20 per cent of the chickens of some flocks were lost after they became too large too fry. It would be hard to estimate the loss in dollars and cents through inefficient gains made on such fowls while being fed an abnormally large ration.

SYMPTOMS

Wormy chickens have ravenous appetites for food, but growth is slow and the plumage is ruffled in appearance and the color is lost from the head. However, these facts are usually overlooked and the first noticeable symptom is lameness, and the attendant may even search for a

thorn in the foot. Diarrhœa may or may not develop. Then the chicken loses control of its muscles, falls over and tumbles around. Eventually, it lays on its side, the muscles become rigid and it dies as though paralyzed all over the body. The chickens live from 3 to 7 days after the lameness appears.

Many flocks are wormy that have no loses in them. These worms can be found by opening the intestines and is the best evidence of this disease.

TREATMENT

Following is a formulæ for the eradication of worms from the intestines. No more losses should be suffered 4 days after the first dose is fed. It is safe, easy to give, and efficient.

(Epsom salts) magnesium sulphate, 5 ounces.
(Magnesia) Magnesium oxide, 1 ounce.
(Copperas) iron sulphate, 1 ounce.
Flowers of sulphur, 1½ ounce.
Ground ginger, 1 ounce.

Make a dry mash of equal parts of corn, bran and shorts. Put 1 rounding tablespoonful of the above formula in one gallon of the mash. Do not feed more mash than the birds will clean up in 20 minutes. Feed the mash every morning with the drugs in it for three days, then discontinue until needed again which may be in a few weeks or in a year. The yards should be covered with quick lime where they are small, the larger yards may be plowed under and put to green crop as wheat, rye or oats. Santonin 10 grains, powdered areca nut, 15 grains, given to 10 chickens in small pills with butter, followed in 6 hours by ½ teaspoonful epsom salts in a mash is another good worm formulæ.

½ to 1 teaspoonful of epsom salts dissolved in water may be given each bird followed by ½ teaspoonful of turpentine. The amount to give depends on the size of the bird as well as the age and breed. The salts should be given 12 to 15 hours before the turpentine. Turpentine is the best remedy for tape worms.

Liquid medicines may be conveniently given birds by using a rubber tube such as is used to carry gas in the cities. These tubes are about ¼ of an inch inside diameter. Insert the tube in the liquid which is in a bottle, place the fore finger over one end of the tube and withdraw the proper dose from the bottle by raising the rubber tube out of the bottle

while the fore finger is over it. Run the vaselined tube with the liquid in it down the fowls throat, being sure to miss the wind pipe, take the fore finger off of the tube and the dose is in the crop.

CROP BOUND

(Impaction)

The lack of the attendant to continually keep coarse sand or grit before poultry is the cause in many cases of not only crop impaction but many other digestive troubles.

Clam shell is often sold for oyster shell and is not, in my opinion, as efficient for digestive purposes.

Continued feeding of new oats or wheat invites impaction. Soaking of such feeds is often beneficial as a preventative. Lack of drinking water induces impaction.

SYMPTOMS

The birds effected lose their appetite, the crop is full and firm, the breath is sour and the bird is inactive.

TREATMENT

Give the effected birds one third to one half teaspoonful of castor or sweet oil or lard oil to each pound of live weight, and gently manipulate the contents of the crop. After manipulating the crop for several minutes hold the bird with the head downward and try to force some of the contents of the crop out through the mouth. If it is impossible to do this, leave the bird alone for a few hours and possibly digestion will start. If it fails to start, an operation is best. Closely clip all feathers over the crop and make an incision about one inch long into the crop, and with a looped wire or button hook remove the contents of the crop and wash it out with warm water. After washing the crop sew it up, taking 4 or 5 stitches to the inch. Paint with Iodine and sew up the outer skin. Feed soaked bread, bran mashes, or some milk, after 5 hours.

GAPES

(*Syngamus Trachealis*)

Gapes may be found in any of the domesticated fowls. Gapes is caused by a reddish blood sucking worm visible to the naked eye. The female is about ½ an inch long while the male is less than ¼ of an inch long. These little worms attach themselves to the walls of the wind pipe obstructing the breathing which causes the chickens to gape. Unless proper steps are taken, the whole flock may be lost.

SYMPTOMS

Breathing becomes difficult, the chicken opening its mouth and gasping for breath, or even suffocation may result. It is more severe in smaller fowls because the wind pipe is smaller and easier obstructed. The gapeing is accompanied by a whistling sound. The appetite is good at first but diminishes as the labored breathing becomes intensified. As a result the little fowls become weak, droop the wings, set the head back in the feathers and lose the color of the head. Often gape worms form a mucous dischargs at the point where they attach to the walls of the wind pipe. Gape worms are usually found in pairs adhering together, making them appear as double headed in the shape of a letter Y. The Y appearance is due to the excessive length of the female.

PREVENTION

To prevent spreading of the disease in a flock is most important in this disease. If chickens have grown properly, very few will die of gapes after they are eight weeks old. The egg of the gape worm is coughed out of the mouth and passed with the bowel passages of the effected chicks. Hence when healthy baby chicks are feeding, these eggs are picked up and gapes develop. At the first appearance of the disease either kill of isolate the gapey chicks. If the effected flock is over six

weeks old, do not move them but thoroughly clean the house, feed and watering troughs with dip water, 1 pint to 1 gallon of water. Clean the house, rake the yard and take all such rubbish away from the pens in a wagon. After thoroughly cleaning, spread a good heavy coat of lime on the roost, walls and floor of the house or coop. It is a good plan in a small lot to cover them with lime and plow the larger lots. It requires about two seasons to rid a chicken lot of gapes by plowing, disinfecting, and growing of green crops. If the chicks are less than six weeks old, build a temporary yard and coop on fresh runs, being very careful that no gapey chicks are taken to the fresh lots and being careful to take out any that may develop gapes on the new runs as soon as they appear. When 6 weeks old, they can be moved back to the main yards and any new born chicks can be placed in the gape free yard. Removal of gapey chicks, frequent cleaning of the yards, roosts and coops and the liberal application of lime are most important in controlling this disease.

TREATMENT

Gape worms can best be removed or killed by securing a small wing feather, of a chicken stripping it of the feather portion, except at the limber end. Dip the feathered end in pure turpentine or kerosene, insert it gently into the wind pipe of the chicken, turn the feather around once or twice while in the wind pipe of the chick and often the worms will be removed or killed as the feather is withdrawn from the wind pipe. Another method is to secure a stiff horse hair. It should be bent double and twisted, forming a small loop on one end. Insert the loop in the wind pipe, hook it over the worms and withdraw them. In treating chicks the operation must be gentle to prevent irritation of the wind pipe. 60 grains of salicylic acid or 1½ ounces of salicylate of soda placed in 1 gallon of drinking water often gives good results in the removal of trachea worms. Less may be used as a preventative where new cases continue to develop in spite of the removal of chicks to a new location. A saturated solution of potassium permanganate may be made by adding 2 drams (2 teaspoonfuls) of the drug to ½ pint of water in a bottle. Then add 1 tablespoonful of the clear solution to each 2 gallons of drinking water. However, if the permanganate is used, there should be no other drug used in the water at the same time.

ROUP

(Croup) (Contagious Catarrh) (Diphtheria)

When the mucous membrane of the throat, mouth and nostrils become inflamed with a fixed membrane that can not be removed, the chickens are said to have diphtheria. Portions of the membrane can be removed as in many cases of roup the chickens are said to have contagious catarrh. Roup, catarrh and diphtheria are probably all caused by the same disease germs. These highly contagious diseases effect chickens, turkeys, pigeons and guineas. Birds may obtain this disease in a show room or it may be brought into a flock by the introduction of new birds that have had the disease. A bird may carry this disease to a healthy flock after they have apparently recovered.

CAUSES

From my experience it is true that conditions that would produce a cold in a person invites roup to a flock of chickens and people are inclined to believe that all air is laden with germs of roup.

I am inclined to believe that a chicken that recovers from roup may be capable of spreading the disease for a year or more. A dark, damp, close, unventilated hen house where many chickens are tightly shut up together is favorable to the development of roup. In such places, the chickens are not only forced to breathe foul air, but if there is a sick chicken in the bunch the disease is sure to spread. Plastering of chicken houses is a mistake. Wheat straw placed above the chickens instead of

(Note swelling of the head and legs. This picture was taken Aug. 4, 1919. The hen had roup the winter before and the swellings would get worse in damp weather. All chickens carrying roup from year to year probably do not show such marked symptoms.)

plastering during the winter months will absorb moisture and serve to retain the heat. Roosting apartments should have ventilation in all or one fourth of the south side depending on the location. Any hen house south of Central Missouri may be built with the whole south side of burlap. This burlap or (gunny sack) is placed there to prevent draughts and furnish fresh air. Flocks that have roup year after year usually have the outbreak soon after the fresh air is shut off during the nights in the winter.

SYMPTOMS

The first symptoms are watery secretions from one or both eyes and the nasal passages. This secretion becomes yellowish, thicker and stickey as the case advances. The fever is high and inflammation of the throat, nasal passages and eyes develops. Swellings appear on the head

and may force the eyes out of their sockets. The bird shakes the head in an effort to remove accumulated pus from the nasal passages. The appetite is not lost but may be checked by blindness or inflamed membrane of the mouth or throat. The birds are depressed and may become unconscious. Associated with the above symptoms a wheezing noise can be heard with the breathing.

PREVENTION

Sell all chickens that recover from roup as they may carry the disease one year or longer. Isolate all show or purchased birds for at least ten days to determine whether or not they are going to develop roup. Chickens that wheeze or water at the eyes or nasal cavities should be kept in separate roosts and lots away from healthy chickens. Furnish ventilation by the use of burlap over the opening in the buildings where healthy chickens roost. Scald the drinking vessels out with boiling water daily. Keep the hen houses clean, using lime and coal tar dips freely after cleaning. Supply plenty of fresh straw. Do not go from the sick coops to houses or pens of well birds without washing the hands and liming the shoes.

HOW TO TREAT THE DRINKING WATER

To treat the drinking water aids the sick birds to recovery and aids materially in checking the disease among the well birds.

Treat all drinking water as follows. Place 2 drams (2 teaspoonfuls) of potassium permanganate in a ½ pint bottle of warm water. Shake well several times but always allow the undissolved crystals to settle before using. Use 1 tablespoonful of the clear saturated solution to each 3 gallons of drinking water. The heads of effected fowls may be bathed or dipped in the saturated solution out of the bottle.

TREATMENT

Soon as they wheeze, become droopy or water at the eyes, give the chicken one teaspoonful of coal oil. Place one tablespoonful of clear saturated solution of potassium permanganate water in each 2 gallons of drinking water, bathe or dip the heads in pure saturated potassium permanganate solution twice daily as soon as they show symptoms of eye watering or wheezing. Following is a treatment for roupy fowls.

Sweet oil, 1 tablespoonful (½ ounce.)
Coal oil, 3 tablespoonfuls (1½ ounces.)
Carbolic acid, 4 or 5 drops.
Camphor, 4 or 5 drops.
Well corked hydrogen peroxide, 1 teaspoonful, (1 dram.)

If hydrogen peroxide is not kept well corked it looses its strength. Place the above formulæ in a sewing machine oil can and twice daily apply a portion to the nostrils and the roof of the mouth. The yellowish membrane that forms over the eyes can be removed when the case advances far enough. In the mouth it may be removed with a tooth pick. The removal of these yellowish membranes is beneficial.

Pussy swellings should be lanced, the contents removed and the wound covered daily with a good healing powder or iodoform.

DIARRHOEA

This disease is often mistaken for fungus poisoning or white diarrhea. Diarrhœa in chicks is usually caused by improper care. Chicks should receive no feed the first 24 hours they are hatched. The first feed should be pulverized charcoal and sand, equal parts. The drinking water should be clean and the chicks should have shade. Hard boiled eggs, wheat, bran and raw oat meal are good feeds for the first few days. A small amount of pepper is beneficial, but an overdose will cause diarrhœa. Irregular feeding, too frequent or over feeding will cause diarrhœa. Damp, close, unventilated quarters invites diarrhœa. Mites and lice often cause diarrhœa. Getting chicks too hot before or after hatching will cause diarrhœa.

TREATMENT

First remove any cause for the trouble, clean and disinfect the coops with lime and ashes, equal parts, sweeping all surplus out. Sharply reduce the feed for a few hours and give them sour milk, hard boiled eggs, oat meal and wheat bran as their chief ration, gradually increasing the feed, and not forgetting to keep charcoal and sand before them constantly. Usually the above is all that is necessary to do, however, in the more ob-

stinate cases 4 to 5 drops of castor oil may be given each chick followed in 5 to 6 hours by placing 1 drop of laudanum to every 3 or 4 chicks in what drinking water they will clean up 3 or 4 times daily. Douglass mixture is excellent for bowel trouble in chicks. It is made as follows; add 2 tablespoonfuls (1 ounce) of sulphuric acid to 1 gallon of water and dissolve ½ pint of iron sulphate (copperas) in the mixture To each quart of the chickens' drinking water add ½ teaspoonful of the mixture.

HOW TO DISTINGUISH IT FROM WHITE DIARRHOEA

Ordinary diarrhœa can not be distinguished from white diarrhœa except by bacteriological examination. Such a diagnosis is gladly made by most experiment station or agricultural college bacteriologists. One or more effected birds should be properly crated and shipped with transportation charges prepaid. Such a diagnosis will aid in future treatments.

WHITE DIARRHOEA

White diarrhœa is the most dreaded of all baby chick diseases. However, people often confuse ordinary diarrhœa and white diarrhœa and thereby lose a whole flock of chicks. Ordinary diarrhœa can often be checked in a short time. It is possible that some concerns take advantage of this fact and give treatments which stops the disease, supposed to have been white diarrhœa. White diarrhœa is a germ disease which lives from year to year in the ovaries of chicks that recover and is thrown out in about 25 per cent of the eggs laid by effected hens. A hen so effected seldom gives the disease to other healthy hens of a flock. However, chicks hatched from infected eggs usually develop the disease in from 2 days to six weeks after they are hatched. Such effected chicks should have a hole punched in the web of the foot if they recover and not be kept for breeding purposes. Avoid breeding females or eggs from effected flocks. These three precautions are absolutely necessary to get rid of the disease. In other words after a female chick recovers, they carry the germs in their ovaries during their life and transmit the disease through the egg to the baby chick. An effected baby chick throws

the germs off in the body passages and infects the feeding ground and water of healthy chicks. This disease seems to be more frequent in incubator chicks than those hatched under hens.

SYMPTOMS

This disease attacks chicks from 2 days to six weeks old. It seldom effects birds over two months old. The effected chicks may die before definite symptoms develop or they may huddle together, become droopy or even sleep, the wings droop, they become short backed and a sticky white discharge develops which terminates in recovery in 30 or 40 per cent of the cases and death in the balance. However, such symptoms do not distinguish it from ordinary diarrhœa, or fungi poisoning.

It can be distinguished from fungi poisoning by reading of that disease, but it is necessary to distinguish it from ordinary diarrhœa to ship one or more effected birds transportation charges prepaid to the agricultural college or experiment station bacteriologist and have a diagnosis made. Such a diagnosis is usually gladly made free, since they are in the service of the people.

TREATMENT

Remove any cause that might be inducive to ordinary diarrhœa. Feed chiefly sour milk which is the best treatment to check white diarrhoea. Scrub the incubator between hatches with 1 tablespoonful of carbolic acid to 1 quart of water. Less chicks may die if the hens are used for hatching. Isolate all sick chicks as soon as seen as they spread the disease. Clean the coops often and spray with a dip solution of 1 pint to 1 gallon of water and follow with lime in the coop and around the yard frequented by the chicks, especially where they are fed. Renew the drinking water often and if possible, keep the chicks feet out of it. Sell off all chicks that recover, punch a whole in the web of the foot to distinguish them. Avoid buying eggs or female stock from effected flocks.

Be sure you have white diarrhœa and not ordinary diarrhœa before establishing the fact you have a sure cure. As far as I have been able to learn, there is no beneficial drug treatment for white diarrhœa. Sour milk often checks it.

BROODER PNEUMONIA

Fungus Poisoning Due to Moldy Straw and Feed, (Lungers,)

(Brooder Pneumonia,) or (Asper Gillosis.)

Fungus poisoning is a disease effecting baby chicks and mature birds. It is most frequent in lots that are damp and where artificial heat is used because steady heat is favorable to fungi development. This mold exists everywhere in nature and multiplies when proper conditions such as heat, moisture, etc., present themselves. It is frequent on musty chaff and straw as well as moldy feed, (because button like elevations or inflammation does not develop, do not conclude the trouble is not in the feed. Moldy feed will cause other digestive and poisonous disorders). Lungers may kill few or many chicks and due to its symptoms, may be mistaken for white diarrhœa.

The effected birds become feverish, droopy, sleepy, sniffle, sometimes breathing is difficult and has associated with it a wheezing noise. Brain disorders or paralysis sometimes develop. A diarrhœa, at first whitish in color, but later changing to a yellowish color, often develops before death. It can be seen by comparison, that these symptoms are not easily to separate from ordinary or white diarrhœa. Fortunately, this is properly a disease effecting the mucous membrane of the mouth, throat, lungs and intestines and can be easily distinguished from ordinary or white diarrhœa by the nodular elevations of the mouth, throat, intestines and lungs. These elevations in advanced cases give off a whitish or yellowish discharge. In the body cavity, the chicks will often have growths of mold. Neither the nodular elevations or mold growths are present in ordinary or white diarrhœa.

TREATMENT

Preventing the use of musty chaff and straw either in the nests or brooder houses is better than any known treatment, after the chicks get brooder pneumonia. Do not feed moldy feeds. After chicks become effected, some relief may be given by painting the inflamed mucous membrane of the mouth or throat with flowers of sulphur or tincture of iodine,

being careful not to use the last in a way that the chicks will swallow it. Fairly good results have been obtained by mixing 2 tablespoonfuls of pine tar in 1 quart of warm water, shake or stir well, and let it set for 4 or 5 hours. Then pour the water on red hot bricks in the coop making tar vapors. The number of bricks necessary will depend on the size of the coop. One is sufficient for a small coop while several are necessary for larger coops. Treat all the drinking water with potassium permanganate water as outlined under roup.

FATTY DEGENERATION OF THE LIVER

Liver troubles are more often caused by having birds too fat in an effort to increase egg production or weight. It more frequently happens birds confined to small enclosures. The combs become a deep red and later become dark. They develop a diarrhœa. The plumage is rough and the birds become droopy.

TREATMENT

Give the birds more exercise and range, change the food from fatteners to non fatteners as bran, alfalfa, skimmed sour milk, etc. Give effected birds ½ of a teaspoonful of castor oil for each pound of live weight and place ¼ of a teaspoonful of tincture of nux vomica in each pint of drinking water.

FEATHER EATING

Feather eating is usually caused by feeding a ration too low in mineral matter. A change to bran, oil meal, milk, etc., will often prevent more birds from forming the habit. To give the birds more range is often beneficial. A teaspoonful of aloes, mixed with ¾ of a teacup full of lard and the ointment rubbed on the feathers that are being picked will often form a disagreeable taste and stop feather plucking.

EGG BOUND

This is sometimes caused by rupture of the internal organs causing the passage to be blocked. Sometimes it is caused by the birds being too fat.

SYMPTOMS

The bird at first makes repeated efforts to lay and finally stands around with symptoms of distress. The egg can be felt in the body cavity just below the vent.

TREATMENT

Sometimes these eggs can be removed by gently manipulating the parts with the hand. To hold the effected parts in hot water for a half hour before manipulation will often aid in delivery but sometimes it is necessary to break the shell and remove a portion at a time.

EGG EATING

Egg eating may be an accidental habit due to a bird breaking an egg or it may be due to lack of grit or oyster shell. The lack of such products not only produces a soft shelled egg but it makes a tempting food. Lack of water invites egg eating.

TREATMENT

Supply grit and oyster shell or bone meal or lime, feed a protein product as beef scraps, oil meal, bran, tankage or sour milk. Some report good success by the use of china nest eggs and scattering a few around for the hens to pick at. Some empty a shell of its contents and fill the shell with red pepper, aloes, mustard or something to give the egg a bad taste. My experience leads me to believe the habit can be materially checkd by oyster shell feeding, grit feeding and plenty of water. Dark nests aid in breaking the habit.

LICE ON CHICKS AND AGED FOWLS

Lice more often develop by not destroying the lice when the houses are cleaned. They can be destroyed in the buildings by cleaning the droppings and nests and spraying all parts with common kerosene. Soon after hatching lice are found on the top of the head and in the down below the vent of the young chickens. When lousy hens are used to set on

the eggs or mother the chicks, they should be dusted before the chicks are hatched and louse free quarters provided. Dipping will often keep hens from setting. At any rate chicks should always be treated for lice before they are forty-eight hours old, if hatched under hens. If hatched in the incubator treat about the tenth day. To do this, take 2 tablespoonfuls of lard for each 75 chicks and add to it sufficient red precipate to make the lard a pale flesh color. The amount of red precipate needed will be in volume about equal to a pea. For young chicks rub a little on the top of the head. After chicks are several days old apply some below the vent and to the downy portion of the wings. The red precipate ointment is a *DEADLY POISON* but in many years of use, by ordinary care, I have had no bad results by its use, and it is very good for lice on chicks. Subsequent treatments are seldom necessary after ten days old. Older birds, if not setting may be dipped in sheep dip, ¼ of a pint to 1 gallon of water. An excellent dusting powder that is effective and cheap for lice on grown fowls is made as follows.

1 part carbolic acid,
3 parts gasoline,

Sufficient plaster paris to make a sifting powder, hold the birds by the legs and dust into the feathers. Use the powder while fresh.

Sodium Floride has met with popular success among many poultry growers. Old birds should be dusted with it before setting and chicks a few days after they are hatched. A dip may be made of it, using 1 ounce to 1 gallon of water.

SCALY LEG–MITES

(*Scaly Leg,*) (*Mange*)

Mites frequently invade the roosts and nests causing irritation to poultry. The application of crude petroleum or creosote such as is used for posts or several applications of kerosene will rid poultry premises of the mites. Another mite causes scaley leg and may effect the combs and wattles. Pure coal oil, applied several times after washing the effected parts with soap and water will cure such cases. Equal parts of raw linseed oil and coal oil makes a good formulæ. Where large numbers are to be treated, dip the feet in the solution and let them drip

over a tub or pan to prevent waste. Sulphur ointment made of 1 part of flowers of sulphur and 4 parts of lard or vaseline is good for most skin diseases.

ENLARGEMENT OF THE LIVER

(Congestion)

CAUSE

This is quite a common disease of chickens. In my opinion a ration composed largely of corn for many months is a more common cause of this trouble than all the other reasons combined. Mouldy feeds and tankage have been blamed for congestion of the liver. The former more frequently causes poisoning while the tankage may be fed in too large quantities. Tankage should not make more than 1 per cent of the ration of chickens.

SYMPTOMS

The chickens die very suddenly with this disease, the bowel passages are normal except where it is associated with so called poultry cholera. In that case the bowel passages are whitish or bright yellow. The liver is enlarged and very easily torn. Blood is usually found inside the body cavity.

TREATMENT

Reduce and change the ration of the entire flock to less fattening feeds as bran and middlings as a mash and feed oats or wheat in straw litter and make them exercise by scratching for it.

The course of this disease is so rapid that treatment is rarely successful. However, I believe 2 teaspoonsful of castor oil given by the mouth is as good a treatment as one can give. This should be repeated daily in 1 teaspoonful doses for a few days.

Some prefer from ½ to 1 teaspoonful of epsom salts.

POISONS AND THEIR ANTIDOTES

When poisons are introduced into a man's system, often the life can be saved by giving him an emetic or a drug or drugs that will cause vomiting. A common example of such a mixture is one tablespoonful each of salt or mustard given in a cup of hot water or coffee. Twice as much may be given to a pig or dog. However, the pig and dog usually vomit of their own accord and the cow and horse can seldom vomit, hence we have to resort to other methods when they are poisoned.

In different forms of poison, different results may be desired. With some poisons, another drug can be introduced into the stomach and by chemical change, a new product can be formed that is harmless or less soluble. Sometimes a drug is introduced to prevent the animal from absorbing all of the poison. Sometimes we try to rush the poison through the system as fast as possible before it is absorbed. As a general rule, oils are the best to expel poisons for they are non-irritating. A quick acting physic as 15 or 20 drops of croton oil may be used in the horse and 20 to 30 drops per 1000 pounds live weight for cattle. Fresh lard whites of eggs, milk or butter may be given to protect the mucous membrane from irritant poisons.

As a general rule, if an acid is taken, it can be neutralized by an alkali, as chalk, water of ammonia, baking soda or soap. If the poison is an alkali as lye, sugar of lead, blue vitrol, vinegar or lemon juice may be given. For poisons of plant or vegetable origin, give a full dose of tannic acid, which for the horse would be two drams and cattle three or four drams. If tannic acid is not available, the inner bark of the smaller limbs of white oak may be given. Give the horse four to six drams and the cow 1½ ounces.

If the poison is of mineral origin give whites of eggs. Below is given the standard antidotes for some of the chief poisons.

Arsenic—Dissolve 4 ounces of copperas in ½ pint of water. Place 1 ounce (2 tablespoonfuls) of magnesia in ½ pint of water and mix the two. This is a dose for a cow and one and a half doses for a horse. Give milk and oil.

Atropine and Belladonna—Give 2 drams (2 level teaspoonfuls) tannic acid to horses and 4 teaspoonfuls to cattle, keep them moving to keep up circulation and rub the limbs well.

Spanish Fly—Give starches, flour gruels and whites of eggs, but give no oils.

Carbolic Acid—Give oils, epsom of salts and whites of eggs.

Nitric, Hydro-chloric, Sulphuric and other Acids—Whites of eggs, chalk, baking soda, lime or soap.

Croton Oil—Give 2 drams tannic acid to a horse and 4 drams to cattle, raw or castor oil, and stimulants as coffee, etc.

Digitalis—Tannic acid, coffee and keep the beast quiet.

Ergot—Give 2 drams tannic acid to the horse, twice daily and oil once daily.

Lead Acetate, (Sugar of Lead)—Give whites of eggs and oils.

Ammonia and Lye—Give vinegar or lemon juice, give slippery elm tea made from the inner bark.

Aconite—Give 2 drams (2 level teaspoonfuls) of tannic acid to the horse, 4 to cattle. In addition give 3 teaspoonfuls of camphor as a stimulant.

Acorns—Give oils and laxative feeds.

Chloroform and Ether—Give ammonia, keep cold cloths to the head and neck and keep them moving.

Antimony—Give 2 drams tannic acid to the horse, 4 drams to the cow.

Mercury—Give 3 or 4 ounces of sulphur to the horse and 5 ounces to the cow. Follow by whites of eggs and milk in large quantities. If an after effect is left, give 1 dram of potassium iodine twice daily.

Turpentine—Give slippery elm bark or tannic acid as antidotes.

Laudanum, Morphine—Give 2 drams (6 level teaspoonfuls) tannic acid and coffee to the horse and 10 level teaspoonfuls to cattle, and keep the beast moving.

Phosphorous—Give 1 and ½ ounces of turpentine to the horse and two ounces to the cow. Avoid oils and milk.

Quinine—Give tannic acid or oak bark tea.

Snake Bite—Cut out the wound and tie a ligature around the limb between the wound and the heart. Apply an antiseptic to the wound. See snake bites in the index.

Nux Vomica, Strychnine—Give large doses of chloral hydrate as 1½ to 2 ounces for the horse or cow in 1½ quarts of water as a drench. If they do not improve, give more until they are under its influence and keep them under it till the effects of poisoning are over. Some may be injected in the rectum. Tannic acid may be given if chloral hydrate can not be obtained.

Common salt—Give lots of water and oil. Stimulate the heart action by giving camphor.

Kerosene—Give stimulants as ammonia, coffee and camphor.

Blue Vitriol—Give 5 or 6 tablespoonfuls of sulphur to the horse, followed by flour gruels and whites of eggs.

Cockls Burr, Ensilage and Forage Poisoning—Physic the animal and stimulate the nerves by the use of nux vomica if necessary.

INSTRUMENTS

Following is a list of concerns handling veterinary supplies.

Snodgrass Drug Co.
1118 Grand Ave.,
Kansas City, Mo.

VARIOUS MAIL ORDER HOUSES

Charles M. Hick & Co.
177 N. State St.
Chicago, Ill.

Sharp & Smith,
Chicago, Ill.

Z. D. Gillman,
Washington, D. C.

BIOLOGICAL PRODUCTS SUCH AS BIACK LEG VACCINE, ANTI HOG CHOLERA SERUM AND BACTERINS

Cutter Laboratory,
180 N. Dearborn St.
Chicago, Ill.
Berkeley, California.

VARIOUS MAIL ORDER HOUSES

Zell Straub Laboratories,
1611 Masonic Temple,
Chicago, Ill.

Frank S. Betz Co.,
Hammond, Ind.
Abbot Laboratories,
Chicago, Ill.

Charles M. Hick & Co.,
177 N. State St.,
Chicago, Ill.

We sometimes wish to reduce a symbol as used by doctors and druggists to common terms.

Below are symbols and their meanings as written often.

Gr. 1—grains 1.
℈ 1—scruple 1.
ʒ 1—drams 1.
℥ 1—ounces 1.
M. or Minum 1—drops 1.
F ʒ 1—fluid drams 1.
O 1—pints 1.
C or Cong—gallons 1.
Mil. is the abbreviation for Millilitre or cubic centimeter.
C. C. stands for cubic centimeter.
4 C. C. equals about 1 teaspoonful.
Sig. stands for directions or times to be taken.
R. X.—take though.
A. A.—same as above.
Q. S. means sufficient, as sufficient water for dough.
F. E. means fluid extract.
T means 1 as drams T.
S. S. means one half.
An example of the use of above formulæ's is given in the following prescription.

White Lotion
Lead Acetate ℥ T equal (1 ounce)
Zinc Sulphate ʒ VI. equal (6 drams.)
Sig.—apply 2 times daily.

LIQUID MEASURE

1 minim equals 1 drop.
1 fluid drachm equals 60 minims or drops.
1 fluid ounce equals 8 fluid drachms or 480 drops.
1 pint equals 20 fluid ounces or 9600 drops.
1 c cm. (cubic centimeter) or millitire equals 1 gram of water.
8 pints, 1 gallon

5 c. cm. (cubic centimeter) is a little less than 1 teaspoonful.

10 c. cm. or (cubic centimeter) equal 10 grammes.

One pint is approximately 480 cubic centimeters.

DRY MEASURE

Medicines should be weighed if possible. A small scale does not cost much.

20 grains, 1 scruple

3 scruples, 1 dram or approximately 1 teaspoonful, 60 grains

8 drams, 1 ounce or approximately 2 tablespoonfuls or 8 teaspoonfuls

1 pound, 12 to 16 ounces.

DISINFECTANTS

A 1 per cent soluton is 3 tablespoonfuls to 1 gallon, or 1½ teaspoonfuls to the pint.

A 2 per cent solution is 6 tablespoonfuls to 1 gallon, or 3 teaspoonfuls to the pint.

A 3 per cent solution is 9½ tablespoonfuls to 1 gallon, or 4½ teaspoonfuls to the pint.

A 4 per cent solution is 13 tablespoonfuls to 1 gallon or 6 teaspoonfuls to the pint.

A 5 per cent solution is 15 tablespoonfuls to 1 gallon, or 6 teaspoonspoonfuls to the pint.

Disinfectants are used to kill or retard disease germs. Carbolic acid and dips are more often used around the farm. A 3 per cent solution of potassium permanganate is as effective as a 5 per cent of either the carbolic acid or sheep dip as a disinfectant. The effectiveness of carbolic acid is greatly increased by adding an equal amount of hydrochloric acid. The crystals of potassium permanganate placed in earthen jars and sulphuric acid poured on it makes the best known disinfectant for a building that can be closed 4 or 5 hours. Anything shut in the building that has animal life will die. It will penetrate clothes in a tight trunk or bedding.

A CONVENIENT AND VALUABLE LIST OF FORMULAES

In some cases several doses should be purchased.

Fluid extract of capsicum, 1 dram
Nux vomica, 1 dram
Chloroform, 2 drams
Cannabas Indica, 2 drams

The above is a dose for colic in horses.

Chloral Hydrate—½ ounce is the dose for the horse and cow. It will relieve pains and produces drowsiness or even sleep. It is an intestinal antiseptic and the best drug known to stop gas formation.

Raw Linseed Oil, 2 quarts is a preferred laxative for horses. It does not cause griping or irritation.

Castor Oil is a preferred laxative for the smaller animals and poultry.

Epsom Salts, 2 pounds, is the preferred drug where we desire to physic cattle. Salts should be kept in an air tight container or they loose their strength.

Tannic Acid, 1½ to 2 drams (8 teaspoonfuls) is the dose for the horse. It is used in severe poisoning, that is of vegetable origin. Such poison may be by plants direct or of plant origin.

Tincture of Iodine, 2 ounces, this is the best antiseptic known for freshly made wounds as nail puncture, or barb wire cuts.

Creolin, Carbolic Acid, Lysol or Coal Tar Dips are good antiseptics for wounds of some days standing.

Oil of sassafras, 2 ounces
Oil of turpentine, 4 ounces
Raw linseed oil, 4 ounces
Croton oil, ½ ounce

The above is a valuable stock linement for lumpy jaw and other swellings. It will cure about 30 per cent of fistula cases if applied when it first appears.

The writing of formulæs by the use of chemical or Latin names for common articles and drugs is gaining popularity among writers and promoters of stock powders. Below, I list a few such articles to enable the farmer so better know what he pays his money for.

Acacia, (Gum Tragacanth)
Acetanilide, (Anti Febrin)
Acetic Acid, (Dilute) (Vinegar)

Acid Boricum, (Boric Acid)
Adepis, (Hog Lard)
Aether, (Ether)
Amylum, (Starch)
Aqua, (Water)
Aqua Regina, (Muratic Acid)
Argenti Nitras, (Lunar Caustic)
Bi-Borate of Soda, (Borax)
Bi-Carbonate of Soda, (The chief ingredient of baking soda.)
Calcium Carbonate, (Chalk)
Calcii Carbonas, (Chalk)
Calcium Oxide, (Lime)
Calx, (Lime)
Camphoræ, (Camphor)
Cantharides, (Spanish Fly)
Capsicum, (Red Pepper)
Caustic Ammonia, (Hart's Horn)
Cera Alba, (White Wax)
Cera Flava, (Yellow Wax)
Carboni Ligni, (Wood Charcoal)
Chloral Hydras, (Chloral Hydrate)
Codeinæ, (Morphine)
Copper Sulphate, (Blue Stone) (Blue Vitriol)
Cretæ Præparatæ, (Prepared Chalk)
Cupri Sulphas, (Blue Vitriol,) (Blue Stone)
Farina Lini, (Linseed Meal)
Ferri Sulphas, (Copperas)
Ferric Sulphate, (Copperas)
Ferrum, (Iron)
Glycerini, (Glycerin)
Glycol Trichlorethylidene, (Chloral Hydrate)
Hydro-chloric Acid, (Muratic Acid)
Hydrogen Oxide, (Water)
Lapis Infernalis, (Lunar Caustic)
Magnesium Sulphate, (Epsom Salts)
Mellis, (Honey)
Mercus Chloride, (Calomel)
Muratic Acid, (Hydro-chloric Acid)
Nucis Vomicæ, (Nux Vomica)

Oleum Crotonis, (Croton Oil)
Oleum Iini, (Linseed Oil)
Oleum Menthal Piperitæ, (Oil of Peppermint)
Oleum Racini, (Castor Oil)
Petrolati, (Petroleum)
Physostigminae, (Calabar Bean)
Plumbi, (Lead)
Plumbi Acetate, (Sugar of Lead)
Potassi Chloras, (Chlorate Potash)
Potassi Tartrate, (Cream of Tartar)
Rhei Radix, (Rhubarb)
Saponis, (Soap)
Silver Nitrate, (Run in sticks is Lunar Caustic.)
Sinapis, (Mustard)
Sodii Bi-borate, (Borax)
Sodii Pyro-borate, (Borax)
Sodii Salicylate, (Salicylic Acid)
Sodii Sulphas, (Glauber's Salts)
Spiritus Aetheris Nitrosi, (Sweet Spirits of Niitre)
Theraci, (Molasses)
Tinc't. Opii, (Laudanum)
Trichlorethylidene Glycol, (Chloral Hydrate)
Zingerberis, (Ginger)

TABLE OF DOSES FOR MATURE STOCK

Young stock should receive doses in proportion to their age and weight.

*Light powdered drugs, as Tannic Acid, 1 teaspoonful does not make 1 dram, while with Potassium Iodide, 1 teaspoonful equals more than 1 dram.

POWERFUL PURGATIVES TO MOVE THE BOWELS QUICKLY

MEDICINE	HORSES	CATTLE	SHEEP	HOGS
Epsom Salts (Fresh)		1½ to 2 pounds.	3 to 8 ounces	2 to 3 ounces
Barbadoes Aloes	½ to 1 ounce	1 to 1½ ounces	3 to 6 drams	1 to 4 drams
Croton Oil	10 to 15 drops	25 to 40 drops.	5 to 7 drops	3 to 7 drops
*Calomel and Aloes	½ to ¾ drams + 4 drams	1 dram Calomel + Epsom Salts 1 pound	10 to 20 grains Calomel Alone	5 to 20 grains Calomel alone

LAXATIVES TO MOVE THE BOWELS GENTLY

Epsom Salts (Fresh)	2 ounces	¾ to 1 pound	2 to 3 ounces	1½ to 2 ounces
Raw Linseed Oil	1 to 2 pints	2 to 3 pints	¼ to ½ pint	¼ pint
Castor Oil	1 pint	1½ pints	¼ pint	3 ounces

ASTRINGENTS TO CHECK DIARRHOEA AND DYSENTERY

Laudanum	1½ to 2 ounces	1½ to 2½ ounces	2 to 4 drams	2 to 3 drams
Bismuth Subnitrate	2 to 4 drams	2 to 4 drams	¾ to 1 dram	½ dram
Oak Bark Tea	1 to 1½ ounces	1½ ounces	2 drams	1 to 1½ drams
Copper Sulphate	1 to 1½ drams	1 to 3½ drams.	¼ to ½ dram	5 to 10 grains
Tannic Acid + Salicylic Acid	1 to 1½ drams + 1 to 1½ drams	1½ to 3 drams + 1½ to 3 drams	¼ to ½ dram + ¼ to ½ dram	¼ dram + ¼ dram

SEDATIVES TO STOP GAS FORMING

Chloral Hydrate	1 to 1½ ounces	1½ to 2 ounces	1 dram	1 dram
Baking Soda	1 to 2 ounces	1 to 2 ounces	2 drams	1 to 2 drams
Tincture of Nux Vomica	1 dram	1 to 1½ drams.	10 to 20 drops	5 to 15 drops
Lime Water (Clear)	4 to 5 ounces	4 to 5 ounces	4 to 6 drams	3 to 5 drams
Tar	2 ounces	3 ounces	3 drams	2 drams

INTESTINAL ANTISEPTICS

MEDICINE	HORSES	CATTLE	SHEEP	HOGS
Turpentine	1½ to 2 ounces	2 to 2½ ounces	1½ drams	1 to 2 drams
Quinine	½ to ¾ drams	½ to ¾ dram	5 to 10 grains	3 to 4 grains
Carbolic Acid	½ to ¾ drams	½ to ¾ dram	5 to 7 drops.	3 to 5 drops
Creolin	3 drams	3 drams	20 to 30 drops	20 to 30 drops
Salicylic Acid	4 to 6 drams.	4 to 6 drams.	1 to 2 drams	½ to 1 dram
Chloral Hydrate	1 to 1½ ounces	1 to 2 ounces	1 to 1½ drams	½ to 1 dram

DRUGS TO INCREASE GASTRIC SECRETION

Jamaica Ginger	4 to 8 drams	1 to 1½ ounces	1 to 1½ drams	½ to 1 dram
Tincture Nux Vomica	1 dram	1 to 1½ drams	10 to 15 drops	5 to 15 drops
Fluid Extract of Capsicum	1 dram	1 to 1½ drams	10 drops	5 to 7 drops

NERVE STIMULANTS TO INCREASE ENDURANCE

Spirits of Camphor	1 to 3 drams	2 to 4 drams	½ to 1½ drams.	¼ to ¾ dram
Tincture Nux Vomica	1 dram	1 to 1½ drams	10 to 15 drops	5 to 15 drops

NERVE TONICS

Nux Vomica	1 dram	1 to 1½ drams	10 to 15 drops	5 to 15 drops
Sweet Spirits of Nitre	1 to 2½ ounces	2 to 3 ounces	2 to 3 drams	1 to 1½ drams

VERMIFUGES TO REMOVE WORMS

*Turpentine	1½ to 2 ounces Raw Oil, 1 to 2 pints	2 to 3 ounces Raw Oil 1 pint	1 to 3 drams	1 to 2½ drams
Tar Tar Emetic	2 to 3 drams	½ to ¾ dram to calves		
Santonin	2 to 3 drams		10 to 15 grains	5 to 15 grains
Areca Nut (fresh)	4 to 6 drams		1½ to 2 drams	1 to 2 drams
Copperas			½ to 1 dram	½ to 1 dram
*Bi-sulphide of Carbon *Raw Linseed Oil	2 ounces 1 pint	For bots		

HEART STIMULANTS

MEDICINE	HORSES	CATTLE	SHEEP	HOGS
Tinct. of Digatalis	2 to 3 drams	2 to 3 drams	¼ to ¾ drams	
Spirits of Camphor	1 to 3 drams	3 to 5 drams	1 to 1½ drams	¼ to ¾ dram

ANTISPASMODIC

Cannabis Indica	1 to 1½ drams	1 to 2 drams	8 drops	5 drops
Spirits of Nitre	1 to 1½ ounces	1½ to 2 ounces	1 dram	½ to ¾ dram
Tar Tar Emetic	2 drams	2 to 3 drams		

DIURETICS TO STIMULATE KIDNEY SECRETION

Salt Petre	½ to ¾ ounce	¾ to 1 ounce	¾ dram	½ dram
Turpentine	1½ to 2 ounces	2 to 2½ ounces	2 drams	2 drams
Common Salt	6 ounces	8 ounces	1 ounce	6 drams

FEBRIFUGE TO REDUCE FEVER

*Aconite	15 drops	20 drops	2 drops	2 drops
*Belladonna	30 drops	40 drops	4 drops	4 drops
Epsom Salts	3 ounces	½ pound	1 ounce	1 ounce
Salt Petre	4 drams	6 drams	½ dram	½ dram
Quinine	1 to 2 drams	3 drams	¼ to ½ dram	¼ dram

NOTE—The enclosure of two drugs in brackets mean they are to be given together.

60 grains, 1 dram, 1 teaspoonful.
8 drams, 1 ounce, 2 tablespoonfuls.
12 to 16 ounces, 1 pound.

Sometimes when a simple formulæ as white lotion is used in barb wire cuts or any other formulæ which the veterinarian wants to disguise and keep its composition secret they add a coloring pigment which makes it a foreign color as red or blue. The veterinarian is usually as curious to know what the farmer uses to cure and where he got it as the farmer is curious to know what the veterinarian uses.

NORMAL TEMPERATURE OF FARM ANIMALS

Horses	100.5	Fahrenheit
Cattle	101.9	Fahrenheit
Hogs	103.3	Fahrenheit
Sheep	104.	Fahrenheit

The temperature is taken by placing the thermometer in the rectum of the animals and leaving it for a few seconds.

The surrounding temperature, excitement, age and disease will cause a variation from normal.

INDEX TO HORSE DEPARTMENT

Abnormal Presentation at Birth - - - - 37
Abscesses Shoulder - - - - - - 74
Age How Determined - - - - - - 25
Anthrax - - - - - - - - 42
Anti-Toxins - - - - - - - 6
Antidotes for Poisons - - - - - 189
Articular Rheumatism - - - - 40
Bacteria - - - - - - - - 5
Bacterin - - - - - - 6
Bacteriology - - - - - - - 5
Barb Wire Cuts - - - - - - - 77
Becks Ointment - - - - - - - 82
Big Head - - - - - - - 65
Bites of Snakes - - - - - - - 60
Bladder Calculi - - - - - - - 28
Bladder, Inflamation of - - - - - 31
Bladder, Paralysis of - - - - - - 61
Bleeding, How Stopped - - - - 61
Blemishes - - - - - - - 68
Blindness - - - - - - - 64
Blisters - - - - - - - 9, 68
Bloat - - - - - - - - 13
Bloody Flux - - - - - - - 36
Bloody Flux of Foals - - - - - - 36
Blood Spavin - - - - - - - 73
Bloody Urine - - - - - - - 31
Blow Fly - - - - - - - - 78
Bog Spavin - - - - - - - 74
Bone, Honey Combining of - - - - - 65
Bone Side - - - - - - - 69
Bone Spavin - - - - - - - 74

Bots - - - - - - - - - 24
Bowels, Inflamation of - - - - - 19
Brain Disorders - - - - - - - 57
Broken Wind - - - - - - - - 56
Bruises of the Frog - - - - - - 71
Bruises - - - - - - - - 72
Bruises of the Shoulder - - - - - 74
Burns - - - - - - - - 79
Calculi Face - - - - - - - 28
Calculi Stone - - - - - - - 28
Calculi Urinary - - - - - - - 28
Calk Wounds - - - - - - - 73
Capped Elbows - - - - - - 72
Capped Hocks - - - - - - - 72
Capped Knee - - - - - - - 72
Carbuncles - - - - - - 42
Care of the Teeth - - - - - - 24
Care of the Young Foal - - - - - 32
Cutaneous Quittor - - - - - - 79
Cattarh, Nasal - - - - - - - 50
Chaffed Shoulders - - - - - - 76
Chaffing of Harness - - - - - - 74
Charbon - - - - - - - - 42
Choke, High and Low - - - - - - 21
Chronic Nasal Catarrh - - - - - 51
Cold in the Head - - - - - - 50
Colic, General Causes of - - - - - 10
Colic Compaction - - - - - - 11
Colic Cramp - - - - - - - 15
Colic Wind - - - - - - - 14
Colt Joint, Ill of - - - - - - 33
Compaction Colic - - - - - - 11
Congestion of Lungs - - - - - - 54
Costipation - - - - - - - 71
Constipation of Foals - - - - - - 35
Convenient Instruments - - - - - 17
Corn Wormy Poisoning - - - - - 56
Costiveness of Colts - - - - - - 35

Cramp Colic - - - - - - - - 15
Cutaneous Quittor - - - - - - 79
Cuts, Wire - - - - - - - - 77
Cystis - - - - - - - - 31
Dentation of the Horse - - - - - - 25
Diabetes - - - - - - - - 27
Diarrhoea of Foals - - - - - - 36
Difficult Foaling - - - - - - 37
Difficult Urination - - - - - - 28
Diseases, Location of - - - - - - 67
Disinfectants - - - - - - - 194
Distemper - - - - - - - - 38
Diuresis - - - - - - - - 27
Douche - - - - - - - - 12
Drenching the Horse - - - - - - 10
Dropsy of the Limbs and Chest - - - - 29
Dysentery of Foals - - - - - - 36
Elbow, Capped - - - - - - - 72
Encephalitis Mengo - - - - - - 56
Engorgment Colic - - - - - - 10
Esophagus, Rupture of - - - - - - 22
Examination of the Eye - - - - - - 62
Excessive Urination - - - - - - 27
Eye, Examination of - - - - - - 62
Eye, Haw of - - - - - - - 62
Eye Inflamation of - - - - - - 63
Eye, Watering of - - - - - - 64
Facial Stone - - - - - - - 28
Farcy and Glanders - - - - - - 44
Feces, Impaction of in Rectum - - - - 11
Feeds, Special - - - - - - - 20
Fever, Lung - - - - - - - 52
Fever, Shipping - - - - - - - 38
Fibrous Tissue, Removal of - - - 75, 77, 78, 81
Firing - - - - - - - - 73
Fistula - - - - - - - - 79
Flatulant Colic - - - - - - - 14
Flesh, Proud - - - - - - - 79

Flies, Maggots of - - - - - - - 78
Flies, Protection of Wounds - - - - - 78
Flour Gruel - - - - - - - - 20
Flux, Bloody - - - - - - - - 36
Foaling, Difficult - - - - - - 37
Foaling, Natural - - - - - - 32
Foals Compaction of Bowels - - - - - 35
Foals Navel Discharge of Urine - - - - 34
Foal's Navel Ill - - - - - - - 33
Foods, Special - - - - - - - 20
Foot Puncture by Nail - - - - - - 70
Foot Thrush - - - - - - - 83
Forage Poisoning - - - - - - 56
Fowler's Solution - - - - - - 56
Founder - - - - - - - - 22
Frog, Bruises of and Shedding - - - - 71
Galls, Harness - - - - - - - 76
Gastro Tymphany - - - - - - 14
Generation of Foals - - - - - - 32
General Principles of Veterinary Medicine - - 8
Glanders - - - - - - - - 44
Gleet, Nasal - - - - - - - 50
Glottis, Swelling of - - - - - - 51
Gravel of the Bladder - - - - - - 28
Grease - - - - - - - - 82
Gruel Flour - - - - - - - 21
Harness Galls - - - - - - - 76
Haw of the Eye - - - - - - - 62
Head, Big - - - - - - - 65
Heat Exhaustion - - - - - - 59
Heaves - - - - - - - - 56
Hemorrhage - - - - - - - 61
Hemorrhagic Septicemia (See Cattle) - - - 114
Hocked, Capped - - - - - - 72
Hydrophobia - - - - - - - 49
Ill, Navel - - - - - - - - 33
Impaction - - - - - - - - 11
Indigestion - - - - - - - 11

Inflamation of the Bladder - - - - - 31
Inflamation of the Bowels - - - - - 19
Inflamation of the Brain - - - - - 56
Inflamation of the Eye - - - - - 62
Inflamation of the Joints - - - - - 40
Inflamation of the Lids - - - - - 63
Inflamation of the Kidneys - - - - - 29
Inflamation of the Muscles - - - - - 40
Instruments, Convenient - - - - - 17
Instrument Supply Houses - - - - - 192
Intestinal Worms - - - - - - 22
Joint Ill - - - - - - - - 33
Joints, Rheumatism of - - - - - 40
Joints, Swelling of - - - - - - 33, 40
Kidney, Disorders of - - - - - - 27
Kidneys, Inflamation of - - - - - 29
Knee, Capped - - - - - - - 72
Labor Pains - - - - - - - 83
Lameness - - - - - - - 22, 71
Laminitis - - - - - - - - 45
Larchymal Opening, Obstruction of - - - - 65
Laryngitis - - - - - - - 51
Lead Poisoning - - - - - - - 190
Lice - - - - - - - - 84
Linseed Tea - - - - - - - 20
Lock Jaw - - - - - - - - 46
Lungs, Congeston of - - - - - - 54
Lungs Pneumonia - - - - - - 52
Madness ("Rabies") - - - - - - 49
Maggots, How Killed - - - - - - 78
Maize Poisoning - - - - - - 56
Medicines, How Used - - - - - 8, 12
Medicines, Doses of - - - - - - 199
Membrane Nicitan - - - - - - 62
Meningo Encephalitis - - - - - - 56
Meningitis (corn stalk poisoning) - - - - 56
Milk Gruel - - - - - - - 20
Moon Blindness - - - - - - - 64

Muscles, Inflamation of - - - - - - 40
Muscles, Wasting of - - - - - - 70
Nail Punctures - - - - - - - 70
Nasal Catarrh - - - - - - - 50
Nasal Gleet - - - - - - - - 56
Natural Foaling - - - - - - 32
Naval Discharge of Urine in Foals - - - - 34
Naval Ill - - - - - - - - 33
Nephritis - - - - - - - - 29
Nerves, Spinal Injuries of - - - - - 57
Normal Temperature - - - - - - 202
Obstruction Colic - - - - - - 11
Open Joints - - - - - - - 33
Opthalmia - - - - - - - 64
Osteomalacia - - - - - - - 65
Over Heat - - - - - - - - 59
Paralysis - - - - - - - - 55
Paresites, Intestinal - - - - - - 22
Paresites of the Skin - - - - - - 84
Partuation, Natural - - - 32
Persistent Urachus - - - - - - 34
Pharynx Rupture of Wall - - - - - 22
Piles - - - - - - - - 83
Pneumonia - - - - - - - 52
Poisoning Antidotes - - - - - - 189
Poisoning, Forage - - - - - - 56
Poll, Evil - - - - - - - - 79
Polyuria - - - - - - - - 27
Preface - - - - - - - - 3
Pregnancy - - - - - - - 32
Principles of Veterinary Medicine - - - - 8
Prolapse of the Rectum - - - - - - 83
Proud Flesh - - - - - - - 79
Quittor - - - - - - - - 79
Scratches - - - - - - - - 82
Shoulder Abscesses - - - - - - 74
Shoulder, Galded - - - - - - 76
Shedding of Frog - - - - - - 71

Shipping Fever - - - - - - - 38
Sit-Fast - - - - - - - - 77
Side Bones - - - - - - - 67, 69
Snake Bites - - - - - - - 60
Soreness of the Feet - - - - - - 71
Sore Necks - - - - - - - 77
Sore Shoulders - - - - - - - 76
Sore Throat - - - - - - - 51
Spasmodic Colic - - - - - - 15
Spavin Blood - - - - - - - 73
Spavin Bone - - - - - - - 74
Special Feeds - - - - - - - 20
Spinal Meningitis - - - - - - 56
Splints - - - - - - - - 68
Sprains - - - - - - - - 72
Stone - - - - - - - - 28
Strangles - - - - - - - - 38
Suffocation - - - - - - - 40
Sulphur Ointment - - - - - - 188
Sun Stroke - - - - - - - - 59
Suppressed Urination - - - - - - 28
Sweat Glands - - - - - - - 59
Swelling of Glottis - - - - - - 51
Swelling of Joints - - - - - - 40, 72
Sweeny - - - - - - - - 70
Tea, Linseed - - - - - - - 20
Teeth, Examination of - - - - - - 24
Teeth, How to Determine Age - - - - 25-26
Temperature, How Taken Normal - - - - 202
Tetanus - - - - - - - - 46
Thorough-Pin - - - - - - - 74
Thrush - - - - - - - - 83
Tymphany Gastro Colic - - - - - - 14
Urachus, Persistent - - - - - - 34
Urinary Calculi - - - - - - - 28
Urination, Excessive - - - - - - 27
Urination Suppressed - - - - - - 28
Urine, Bloody - - - - - - - 31

Urine Navel discharge of in Foals - - - - 34
Urine, Natural - - - - - - - 27
Unsoundness - - - - - - - 68
Vomiting - - - - - - - 189
Warts (see calves) - - - - - - 103
Wasting of Muscles - - - - - - 70
Water on the Joints - - - - - - 33
Watering of the Eyes - - - - - - 65
White Lotion - - - - - - - 78
Wind Broken - - - - - - - 56
Wind Colic - - - - - - - 14
Wire Cuts - - - - - - - 77
Wool Sorter's Disease - - - - - - 42
Worm Colic - - - - - - - 23
Wormy Corn Poisoning - - - - - 56
Worms, Intestinal - - - - - - 22

INDEX TO CATTLE DEPARTMENT

Aborton Contagious - - - - - - - 92
Acid Poisoning - - - - - - - 189
Aconite Poisoning - - - - - - - 190
Actinomycosis - - - - - - - - 109
Afterbirth, Retention of - - - - - - 97
Alkali Poisoning - - - - - - - 189
Anthrax (see horses) - - - - - - - 42
Antidotes for Poisoning - - - - - - 189
Bacteria - - - - - - - - - - - - 5
Bacterian - - - - - - - - - - 6
Bacteriology - - - - - - - - - 5
Barb Wire Cuts (see horses) - - - - - 77
Big Head (see horses) - - - - - - 65
Bites of Snakes (see horses) - - - - - - 60
Black Leg - - - - - - - - 117
Bleeding, How Stopped (see horses) - - - - 61
Blisters - - - - - - - - 9, 68, 100, 110
Bloating - - - - - - - - 86
Blow Fly (see horses) - - - - - - 133
Blue Lice - - - - - - - - 133
Blue Milk - - - - - - - - 128
Brain Disorders (Cerebro Spinal Meningitis) - - - 89
Breeding-non Cows - - - - - - - 92
Bruises - - - - - - - 129
Buffalo Disease - - - - - - - - 114
Calculi, Stone (see horses) - - - - - - 28
Calf Scours - - - - - - - - 99
Calf Slinking - - - - - - - 92
Calves, New Born Scouring - - - - - - 99
Carbolic Acid Poisoning - - - - - - 190
Carbuncles of the Skin - - - - - - - 42

Cerebro Spinal Meningitis - - - - - 114
Charbon - - - - - - - 42
Choke - - - - - - - 21
Coal Oil Poisoning - - - - - 190
Colic (see horses) - - - - - 85, 124
Constipation - - - - - - 91
Constipation of Calves - - - - - 102
Consumption - - - - - - 119
Contagious Abortion - - - - - 92
Contagious Foot and Mouth Disease - - - 103
Contagious Scouring of Calves - - - - 98
Cud, Loss of - - - - - - 90
Cuts, Barbed Wire (see horses) - - - 77
Deer Disease - - - - - - 114
Dehorning - - - - - - 130
Diarrhœa - - - - - - 88
Diarrhœa of Calves - - - - - 99
Difficult Calving - - - - - - 96
Disinfectants - - - - - - - 194
Distension of the Rumen - - - - - 86
Douches - - - - - - - - 97
Dry Murrain - - - - - - - 86
Dysentry of Calves - - - - - - 88
Enteritis, Gastro - - - - - - 86
Ergotism - - - - - - - 107
Esophagus Rupture of the walls (see horses) - - 22
Eye Infectious Opthalmia - - - - - 127
False Foot and Mouth Disease - - - - 107
Feeds, Special - - - - - - - 20
Fever, Milk - - - - - - - 124
Fever Partuation (milk) - - - - - 124
Fever, Texas - - - - - - - 111
Fly Blow - - - - - - - 133
Fly Spanish Poisoning - - - - - 190
Foot, Soreness of - - - - - - 103
Foot and Mouth Disease, Contagious - - - 103
Foot and Mouth Disease, Non-Contagious - - 107
Founder (see horses) - - - - - - 22

Forage Poisoning - - - - - - - 89
Fungi Poisoning - - - - - - - 89
Garget - - - - - - - - - 129
Gas in the Abdomen - - - - - - 86
Gastro Intestinal Catarrh - - - - - 86
Gravel (see horses) - - - - - - 28
Gullet Rupture of the Walls - - - - - 22
Health, Public Relation of Tuberculosis to - - 122
Heat Exhaustion - - - - - - - 59
Hemorrhage Treatment - - - - - 61
Hemorrhagic Septicemia - - - - - 114
Hoven (bloating) - - - - - - 86
Hydrophobia (see horses) - - - - - 49
Indigestion - - - - - - - - 90
Indigestion of Calves - - - - - -99
Impaction of Stomach - - - - - - 85
Infectious Mastitis - - - - - - 129
Inflamation of the Udder - - - - - 129
Inflamation of the Joints and Muscles - - - 131
Itch - - - - - - - - - 127
Labor Pains - - - - - - - 96
Lead Poisoning - - - - - - 190
Lice - - - - - - - - - 133
Lock Jaw (see horses) - - - - - 46
Loss of Cud - - - - - - - 90
Lumpy Jaw - - - - - - - 109
Maggots, How Killed - - - - - 133
Mastitis, Infectious - - - - - - 129
Mange - - - - - - - - 127
Medicines, Administration of - - - - 10
Medicines, Doses of - - - - - 203
Milk, Blue - - - - - - - 128
Milk Fever - - - - - - - 124
Milk, Stringy (ropy) - - - - - 128
Mineral Poisoning - - - - - - 190
Murran, Dry - - - - - - - 86
Non Infectious Foot and Mouth Disease - - - 107
Non-Breeders - - - - - - - 92

Opthalmia, Infectious - - - - - 127
Overlooking of the Punch - - - - - 85
Pains, Labor - - - - - - - 96
Paralysis of the Hind Quarters - - - - 95
Partuation Fever - - - - - - 124
Partuation, Difficult - - - - - - 96
Paunch, Distension of - - - - - 86
Pharnyx Rupture of Walls (see horses) - - - 21
Phosphorus Poisoning - - - - - - 190
Piles - - - - - - - - - 126
Pink Eye - - - - - - - - 127
Piroplasmosis - - - - - - - 111
Plant Poisoning - - - - - - 89
Plant Poisoning Antidotes - - - - - 189
Pneumonia (see horses) - - - - - 52, 114
Poisoning, Antidotes for - - - - - 189
Prolapse of Rectum - - - - - - 126
Proud Flesh (see horses) - - - - - 79
Quarter Ill - - - - - - - 117
Rabies (see horses) - - - - - 49
Red Water - - - - - - - 111
Retention af the Afterbirth - - - - - 97
Rheumatism - - - - - - - 131
Ring Worm of Calves - - - - - 102
Rumen, Distension of - - - - - - 86
Salt Poisoning - - - - - - 189
Scab of Calves - - - - - - 102
Scabies - - - - - - - 127
Scours of Cattle - - - - - - 88
Scouring Contagious, White Calves - - - 98
Scours Ordinary, of Calves - - - - 99
Scours of Cattle - - - - - - 88
Slinking of Calves - - - - - - 93
Snake Bites (see horses) - - - - - 60
Sore Foot - - - - - - - 103
Sprains - - - - - - - - 129
Staggers - - - - - - - 89
Sterile Cows - - - - - - - 92

Stomach, Impaction of - - - - - 85
Stone - - - - - - - - - 28
Stringy Milk - - - - - - - 128
Temperature, Normal - - - - - 202
Temperature, How Taken - - - - - 202
Tetanus (see horses) - - - - - 46
Texas Fever - - - - - - - 111
Throat, Rupture of the Walls (see horses) - - 22
Tongue, Wooden - - - - - - 109
Tuberculosis - - - - - - - 119
Tuberculosis and the Public - - - - 123
Udder, Inflamation of - - - - - 129
Urachus, Persistent (see foals) - - - 34
Urinary Calculi (see horses) - - - - 28
Urine, Bloody (see horses) - - - - - 31
Urine, Suppressed (see horses) - - - 28
Urine, Excessive (see horses) - - - - 27
Vomiting - - - - - - - 189
Warts - - - - - - - - 103
Water, Red - - - - - - 111
Wooden Tongue - - - - - - 109
Wool Sorters' Disease - - - - - 42
Wormy Corn Poisoning (see horses) - - - - 56

INDEX TO HOG DEPARTMENT

Abortion of Sows - - - - - - - 151
Aid in Farrowing - - - - - - - 152
Anti-Hog-Cholera Serum - - - - - 141
Carriers of Hog Cholera - - - - - 139
Castration, Proper - - - - - - - 154
Castration of Ruptured Pigs - - - - - 156
Cholera - - - - - - - - - 135
Cockle Burr Poisoning - - - - - 143
Combination Method of Immuning - - - - 142
Cough - - - - - - - - 137, 148
Decay of Bone and Tissue - - - - - 160
Difficult Farrowing - - - - - - 152
Disinfectants - - - - - - - - 194
Ecraseur - - - - - - - - - 155
Emasculator - - - - - - - - 155
Farrowing, Difficult - - - - - - 152
Fever, Swine - - - - - - - - 135
Hemorrhagic Septicemia - - - - - 135
Hog Cholera - - - - - - - - 135
Hog Cholera, Carriers of - - - - - 139
Hog Cholera, Diagnosing - - - - - 136
Hog Lice - - - - - - - - - 159
Indigestion - - - - - - - - 144
Itch - - - - - - - - - 158
Intestinal Worms - - - - - - 144
Lameness - - - - - - - - 149
Lice - - - - - - - - - 159
Lock Jaw - - - - - - - - 158
Loss of Use of Hind Quarters - - - - 149

Lung Worms - - - - - - - - 148
Kerosene Emulsion - - - - - - 159
Kidney Worm - - - - - - - 149
Mange - - - - - - - - 158
Medicine, Doses of - - - - - - 203
Mixed Infection - - - - - - 135
Necrotic Stomatitis - - - - - - 160
Paralysis - - - - - - - 150
Piles - - - - - - - - 151
Pig Scours - - - - - - - 153
Pnemonia - - - - - - - 135
Poisoning, Cockle Burr - - - - - 143
Precautions of Hog Cholera - - - - 139
Prevention of Hog Cholera - - - - - 139
Prevention of Worms - - - - - 144
Protrusion of the Rectum - - - - - 151
Quinsy - - - - - - - - 148
Rectum, Prolapse of - - - - - - 151
Rheumatism - - - - - - - 149
Round Worms - - - - - - - 144
Ruptured Pigs, Castration of - - - - 156
Scab - - - - - - - - - 158
Scours in Pigs - - - - - - - 153
Serums - - - - - - - - 141
Simultaneous Method of Immuning - - - 142
Slinking of the Pigs - - - - - - 151
Snake Bites (see horses) - - - - - 60
So Called Hog Cholera Preventatives - - - 141, 147
Sow Abortion - - - - - - 151
Stock Powders and Tonics - - - - - 147
Stomatitis, Necrotic - - - - - - 160
Sun Scald - - - - - - - 158
Swine Plague - - - - - - - 135
Swine Fever - - - - - - - 135
Tetanus - - - - - - - - 158
Thron Headed Worms - - - - - 144
Thumps - - - - - - - - 153
Toncis - - - - - - - - 147

Tusks, How Removed - - - - - - 157
Treatment for Worms - - - - - - 145
Worms, Lung - - - - - - - 144
Worms, Prevention of - - - - - - 144
Worms, Treatment for - - - - - - 145
Worm, Kidney - - - - - - - 149

INDEX TO SHEEP DEPARTMENT

Administration of Medimcines - - - - - 163
Bloat - - - - - - - - - 164
Brain Disorders - - - - - - - - 164
Catarrh - - - - - - - - - 170
Colic - - - - - - - - - - 166
Constipation - - - - - - - - 166
Corn Fodder Poisoning - - - - - 164
Diarrhoea - - - - - - - - 166
Distention by Gas - - - - - - 164
Distomatosis - - - - - - - - 171
Drenching of Sheep - - - - - - 163
Ensilage Poisoning - - - - - - 164
Forage Poisoning - - - - - - - 164
Fluke Liver - - - - - - - - 164
Gas in the Rumen - - - - - - 164
Grub in the Head - - - - - - 170
Head Grubs - - - - - - - - 170
Hoven - - - - - - - - - 164
Itch - - - - - - - - - 166
Lime and Sulphur Dip - - - - - 168
Liver Fluke - - - - - - - - 171
Liver Rot - - - - - - - - 171
Maggots, How Killed (see cattle) - - - - 133
Mange - - - - - - - - - 166
Medicines, Doses of - - - - - - 203
Nasal Catarrh - - - - - - - - 170
Piles - - - - - - - - - 165
Poisoning, Forage - - - - - - 164
Poisoning, Antidotes for - - - - - 189

Prolapse of Rectum - - - - - - 165
Rectum, Prolapse of - - - - - - 165
Scab - - - - - - - - 166
Staggers - - - - - - - 164
Stomach Worms - - - - - - 162
Sulphur Dips - - - - - - - 168
Tobacco and Sulphur Dip - - - - - 168
Tape Worms - - - - - - - 162
Worms in Sheep - - - - - - - 162

INDEX TO POULTRY DEPARTMENT

Aspergillosis - - - - - - 184
Bacteria of Eggs - - - - - - 182
Bound, Crop - - - - - - - 175
Brain Disorders - - - - - - 173
Brooder Pneumonia - - - - - - 184
Catarrh - - - - - - - - 178
Cholera - - - - - - - - 172
Contagious Catarrh - - - - - - 178
Crop, Impaction of - - - - - - 175
Croup - - - - - - - - 178
Diarrhoea, Ordinary of Chicks - - - - 181
Diarrhoea White, of Chicks - - - - - 182
Diptheria - - - - - - - 178
Disinfectants - - - - - - - 194
Douglass Mixture - - - - - - 182
Eggs, Bacteria in - - - - - - 182
Egg Bound - - - - - - - 185
Egg Eating - - - - - - - 186
External Paresites - - - - - - 186
Fatty Degeneration of the Liver - - - - 185
Feather Eating - - - - - - 185
Flies, Maggots - - - - - - - 133
Fowl Cholera - - - - - - - 172
Fungus Poisoning - - - - - - 184
Gapes - - - - - - - - 176
Impaction - - - - - - - 175
Internal Paresites - - - - - - 173
Intestinal Paresites - - - - - - 173
Lameness - - - - - - - 173
Lice - - - - - - - - 187

Lungers - - - - - - - - - 184
Mange - - - - - - - - - 187
Maggots - - - - - - - - 133
Mites - - - - - - - - - 187
Paralysis - - - - - - - - 173
Paresites, Intestinal - - - - - - - 173
Paresites, External - - - - - - - 187
Pneumonia, Brooder - - - - - - - 184
Poisons and their Antidotes - - - - - 189
Roup - - - - - - - - - 178
Syngamus Trachealis - - - - - - - 176
Scaly Leg - - - - - - - - 187
Sulphur Ointment - - - - - - - 188
Trachea Worms - - - - - - - 176
White Diarrhoea - - - - - - - 182
Worms - - - - - - - - - 173

LIBRARY OF CONGRESS
0 002 825 502 0